the OIL AND GAS JOURNAL

Here's A Very Good Reason WE RECOMMEND OUR CONTRACTORS SEND OUT FRANKS UNITS

Franks Model 658-DTM Cruiser operating in West Texas, is the scene of operation of Franks Research Trailer. The close up picture shows Tommy Patton conferring with Monroe Fullum, Tool Pusher, about improvement which will be turned in to the factory.

FRANKS NEW RESEARCH TRAILER LATEST AID IN PROVIDING FIELD PROVEN DESIGN

The Manufacturer that really has our complete interest at heart, goes to the heart of our problem.

WHAT DOES FRANKS RESEARCH DEPARTMENT DO?

1. **It gets every well servicing, workover, and drilling requirement first-hand — direct from the men working at the well, when the problem occurs, whether day or night.**
2. **"On the Spot" it takes advice of your men with years of field experience, combining Franks years of design experience to develop "On the Spot" elements to make the best equipment even better.**
3. **Checks service mechanics and rig operators experience to make Franks units live even longer and tougher lives.**

WHERE DOES IT GO?

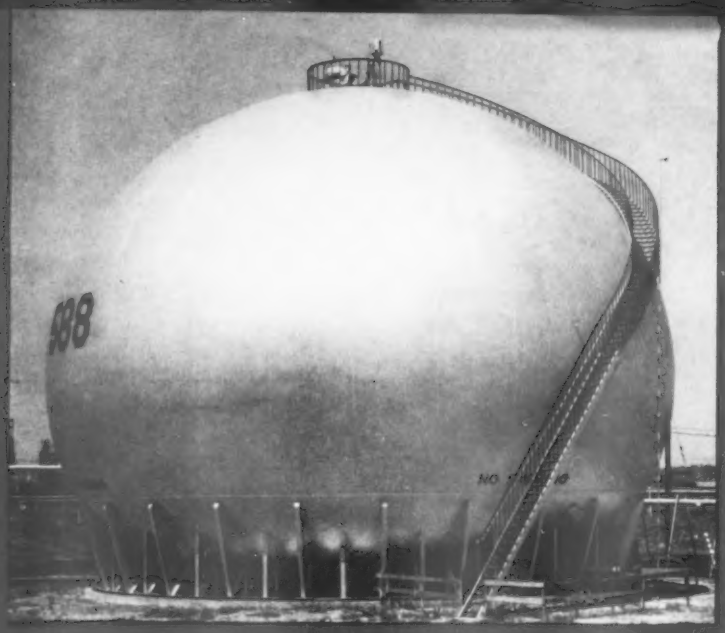
1. **To every oil field in North America, the Franks Research Trailer offers its services to your specific drilling and servicing problems, providing the finest and most economical machinery to do your job. With air conditioning and heating, deluxe living quarters, its research crew spend night and day and weeks with your men. We will welcome your invitation to join you on your location.**

He who follows Franks pathway of FIRSTS, will be "Not among the best, but *the* best," be he customer or competitor.

FRANKS MFG. CORP.
WELL SERVICING AND DRILLING UNITS
TULSA, OKLAHOMA

"on the SPOT" FIELD SERVICE

On the spot field service, with factory trained crews, stock of parts and 24-hour service is located at Odessa, Houston, Alice, Casper, Kilgore, Compton, Edmonton, and Tulsa.



Storing Butane

at 40 lbs. per sq. in. pressure

Three 30,000-bbl. Hortonspheroids 73 ft. 4 in. in diam. by 61 ft. 6 in. high are used to store a butane blend at 40 lbs. per sq. in. working pressure at the Mid-Continent Petroleum Corporation refinery in West Tulsa, Oklahoma.

The Hortonspheroid is a pressure container for the storage of volatile liquids. Its purpose is to prevent excessive evaporation losses which occur when such products are stored and handled in storage tanks that operate at or near atmospheric pressure.

When storing natural gasoline, butane or other volatile hydrocarbons, Hortonspheroids protect the volatility and quality of the liquid; substantially reduce the hazard of fire; and—most important in today's world of critical shortages—offer a more efficient utilization of steel. The Hortonspheroid can be designed to withstand the vapor pressure at the maximum liquid surface temperature encountered in storage.

Hortonspheroids enjoy general acceptance because they combine the three prerequisites of better performance—efficiency, safety, and economy.

Hortonspheroids are built in capacities from 2,000 to 120,000 bbls. for pressures from 2½ to 100 lbs. per sq. in. Write our nearest office for further information or quotations.

Partial List of Horton* Structures for the Petroleum Industry

- *Horton Floating Roofs*
- *Horton Lifter Roofs*
- *Horton Vaporspheres*
- *Horton Vaportanks*
- *Hortonspheres*
- *Hemispheroids*
- *Hortondome Roofs*
- *Flat Bottom Tanks*
- *Pressure Vessels*
- *Refinery Towers*
- *Elevated Tanks*

**Registered in U. S. Patent Office*

CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3.....2154 Healey Bldg.
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Boston, 10.....1025-201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 C & I Life Bldg.
Los Angeles, 17.....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
Philadelphia, 3.....1615—1700 Walnut Street Bldg.
San Francisco, 4.....1554—200 Bush St.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg.
Washington 6, D. C.....1139 Cafritz Bldg.

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THE OIL AND GAS
JOURNAL
Vol. 51, No. 25

NEXT WEEK

- For the refiner — A 14-page special section on insulation in the refinery. Details of design, specification, application, maintenance, and storage are given for new material used for high-temperature insulation. Special considerations for low-temperature insulation are also given.
- E. V. Murphree, of Standard Oil Development Co., explains where tomorrow's oil will come from.
- Water Flooding in Kansas' "Golden Lane."
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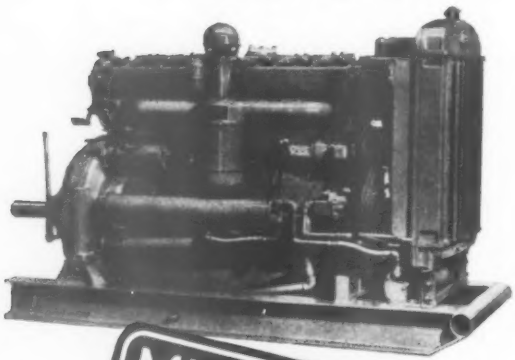
It's MURPHY DIESEL POWER for Powell Drilling Co.

THE BEST WAY TO MAKE MORE HOLE AT LESS COST



MURPHY DIESEL

Heavy duty power
for the oilfields

Murphy Diesel Engines and Power Units for drilling and pipe line pumping, 90 to 226 H.P., 1200 and 1400 RPM. Generator Sets, 60 to 140 K.W. Dual-Fuel Engines, 135 to 180 H.P. Also Crude Oil Burning Engines.

242

WITH drilling costs rising steadily, the economy, dependability and long life of Murphy Diesels is more important than ever before. For any given job, the heavy duty Murphy Diesel uses less fuel per horsepower hour, runs longer between overhauls and lasts longer than any other engine of comparable size. A broad statement? Yes, but it's backed up by actual performance records in the field. For you, it all adds up to more hole at less cost.

That's the reason Powell Drilling Co. recently installed two Murphy Diesels each rated at 165 H.P. continuous, 180 H.P. intermittent on their Emsco GB-350 rig. The engines also power a Gardner-Denver 7¼"x14" mud pump. When the photograph above was made, the rig was working in Trego County, Kansas.

If you want to reduce your drilling costs, call your Murphy Diesel Dealer. He'll show you how you can do it with Murphy Diesel power.

MURPHY DIESEL COMPANY
5305 W. Burnham St., Milwaukee 14, Wisconsin
Tulsa Office—Sales, Parts and Service:
113-117 South Elwood Street, Tulsa, Oklahoma
Sales, Parts, Service

See Your Murphy Diesel Dealer

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DALLAS & LUBBOCK, TEXAS
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Ed. Meyer Tractor Co.
GREAT BEND, KANSAS
Manufacturers Dist. Co.

Only B. F. Goodrich makes the grommet belts that cut costs 20 to 50%!

Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted others. Some typical cases:

"... within a few days ordinary belts had stretched ... After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all ..."

"Ordinary belts lasted only 5 or 6 weeks ... B. F. Goodrich grommet belts are in their sixth month of service ..."

"Previous belts suffered from shock loads, wore out fast ... BFG grommet belts have been in service 2 years with no shut-downs..."

There are hundreds of cases like these.

They cost no more

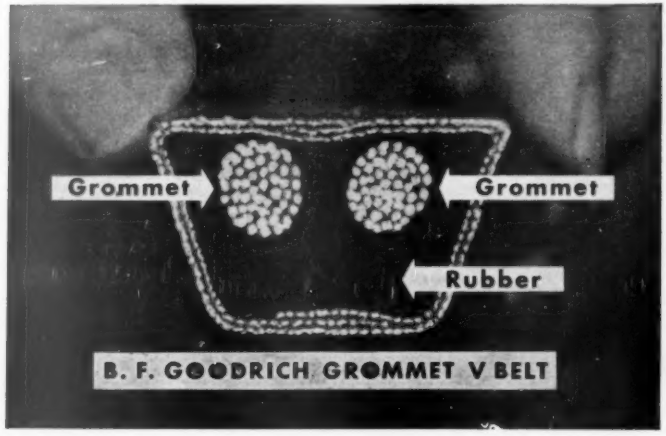
BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet V-Belts BY

B.F.Goodrich

FIRST IN RUBBER



The B. F. Goodrich Company
Dept. OJ-10
Akron, Ohio

☐ Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.

☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

Name_____

Firm Name_____

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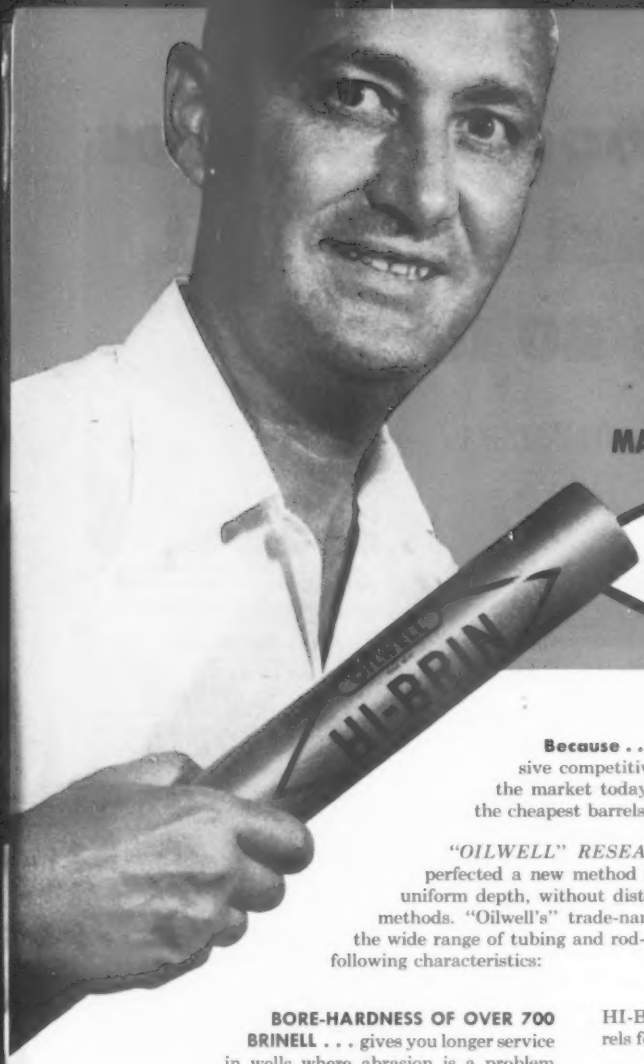

YOU'LL BE HEARING A LOT
...ABOUT THE NEW "OILWELL"

SUBSURFACE PUMP BARRELS,

MADE OF

"OILWELL"
TRADE MARK
HI-BRIN
OIL WELL SUPPLY
DIVISION U. S. STEEL
DALLAS, TEXAS
MADE IN U. S. A.

Because . . . they are far better than the most expensive competitive one-piece plunger or working barrels on the market today . . . yet are priced but little higher than the cheapest barrels you can buy.

"OILWELL" RESEARCH ENGINEERS have developed and perfected a new method for bore-hardening alloy steel barrels to a uniform depth, without distorting the barrel as in ordinary hardening methods. "Oilwell's" trade-name for this process is HI-BRIN . . . and the wide range of tubing and rod-type barrels now being produced, have the following characteristics:

BORE-HARDNESS OF OVER 700 BRINELL . . . gives you longer service in wells where abrasion is a problem . . . or extraordinary service-life in ordinary wells. HI-BRIN Barrels also have outstanding corrosion-resistant qualities.

EXTREMELY ACCURATE PLUNGER FITS . . . are achieved because uniform bore-hardened thicknesses, plus distortion-free barrels, permit honing operations that result in total barrel-diameter variations held to plus or minus .001". This is far less than the tolerances permitted by API standards.

BIGGER BORES IN ROD-TYPE BARRELS . . . are now available, than was possible as long as liner-type construction was required to secure bore-hardness in the HI-BRIN range. For example: HI-BRIN rod-type barrels for use in 2" tubing are made with bores up to $1\frac{1}{2}$".

—AND FOR THE

greatest surprise of all...

. . . ask your nearest "Oilwell" Representative for a quotation on HI-BRIN Barrels . . . and compare costs with the barrels you are now using.

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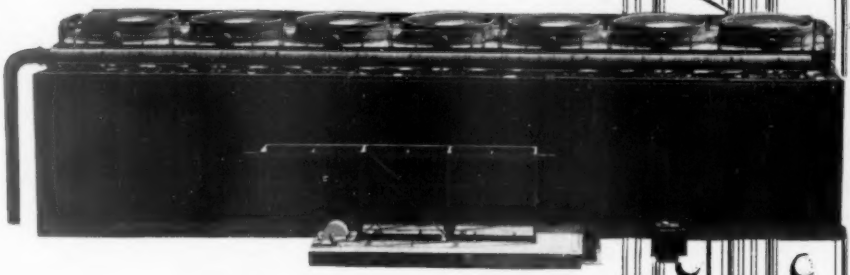
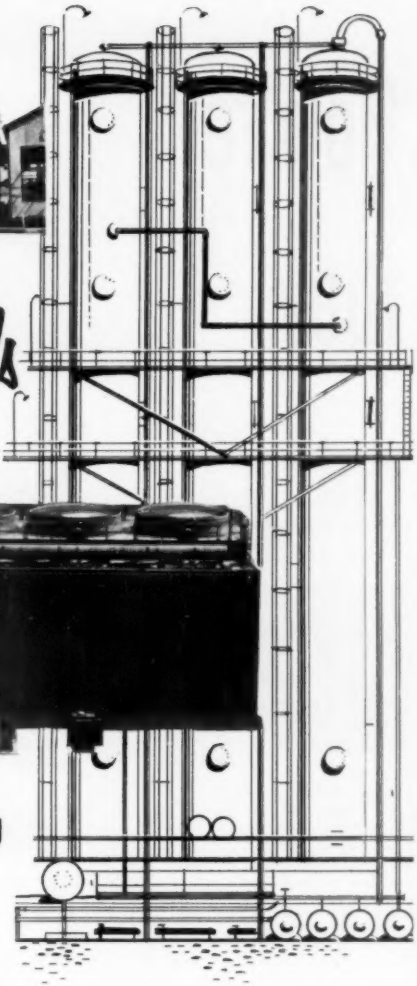
UNITED STATES STEEL

Petrochemicals

Americas "hottest" industry...





..turns to **MARLEY** for cooling

The meteoric rise of petrochemical production marks it as America's "hottest" industry. And keeping pace with petrochemicals, Marley offers the industry the world's most complete line of water cooling towers and DriCooler heat exchangers with everything that is modern in design and mechanical equipment.

Marley cooling towers are a natural choice for plants producing synthetic rubber, synthetic fibers, nitrates, and other base chemicals. They have stood the test of time in the allied fields of petroleum and natural gas with such outstanding success that today Marley cooling towers cool more gallons of water in these industries than any other make.

In Marley's complete line—the only complete line—there's a tower just made to handle your petrochemical cooling problem, whether your cooling method uses cold water or air for heat transfer. Call in the Marley man today for a fair evaluation of your cooling requirement, without cost or obligation.

Producers of
DOUBLE FLOW TOWERS
DRICOOLERS
AQUATOWERS
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CONVENTIONAL TOWERS
SPRAY NOZZLES
DOUBLE FLOW AQUATOWERS

Engineering Sales Offices in 50 Cities

The Marley Company

Kansas City 5, Missouri

MARLEY

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"How're they doing, Mr. Beaird?"

"These two 'Cats' have drilled 260,000 feet of hole," replied Mr. Walter E. Beaird, co-owner of the Carco Drilling Co., Dallas, Texas. "We purchased them because the three D13000s bought previously had drilled 500,000 feet of hole and were still going strong. We've standardized on 'Cats' because they seldom, if ever, give any trouble."

These two D13000 Oilfield Engines are compounded to power the Emsco draw works and Gardner-Denver mud pump in Carco's wildcat operation in Wood County, Texas. This is a 7,500-foot portable rig. The engines use only 285 gallons of fuel a day and work 24 hours a day 8 to 12 months a year.

All "Caterpillar" Diesels, like these two, are ruggedly built to stand up under conditions that make ordinary engines cry quits. They burn low-grade fuel without fouling and are so simple to operate they're practically fool-proof. You can count on them to deliver for you with a minimum of down-time!

For further *facts*, see the man who's always available for service or information—your nearby "Caterpillar" Dealer. Ask him to show you *field records* on the performance of these dependable yellow oilfield engines!

CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

Oilfield Engines

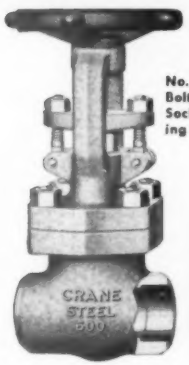
why CRANE 600-pound small steel gates are sure to meet your needs

You can't top these Crane Small Steel Gates for dependable performance on high pressure, high temperature lines . . . for ease of operation . . . for simplified maintenance. That's because they include design features normally found only in larger or more expensive valves.

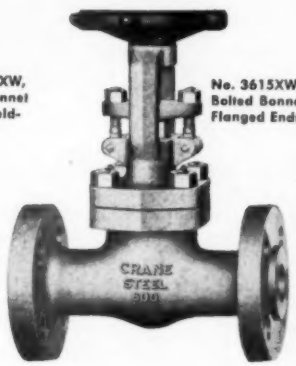
Then too, these Crane valves are available in a choice of types to meet your particular requirements. For example, with union or bolted bonnets; with screwed, flanged, or socket-welding ends; and in trim materials recommended for all common fluids.

GET NEW DESCRIPTIVE CIRCULAR AD-1881

For complete information—including prices—about these longer lasting, easier operating Crane Small Steel Gate Valves. Ask your Crane Representative for your copy, or write direct. No obligation.



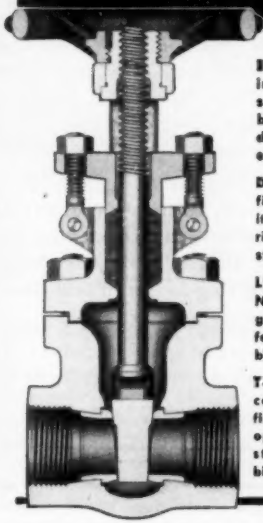
No. 3611XW, Bolted Bonnet Socket-Welding Ends



No. 3615XW, Bolted Bonnet Flanged Ends

UNION BONNET GATE. Screwed ends. Sizes: ¼ to 2-inch. Available in three different trim materials for a wide range of services. Also with socket welding ends

Easy to Operate... Easy to Service



EASY ACCESS to stuffing box assured by swinging gland eyebolts. Improved yoke design provides liberal working space.

DEEP STUFFING BOX filled with high quality asbestos packing rings maintains tight stem seal.

LEAKPROOF BONNET JOINT. Soft iron gasket in male and female joint cannot blow out.

T-HEAD DISC-STEM connection provides flexibility for smooth operation; prevents stem distortion or binding of parts.

Cross-section No. 3607XW, Bolted Bonnet Gate, Screwed

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VALVES • FITTINGS • PIPE • PLUMBING • HEATING

DARLING
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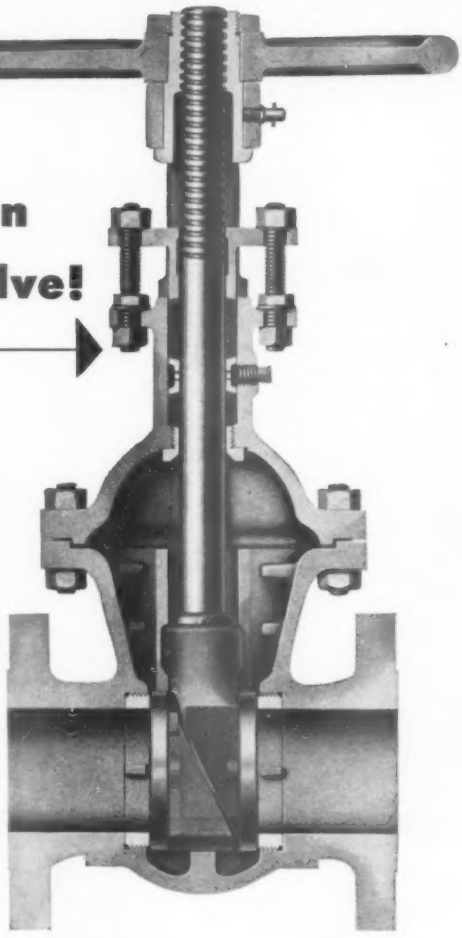
VALVES

FOR PLUS VALUES, JOB-PROVED AGAIN AND AGAIN

Valve body distortion no problem for this valve!



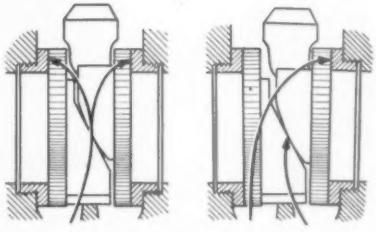
DON'T let costly valve maintenance and down-time headaches get you down! Lick these common valve troubles by installing Darling fully revolving double disc gate valves, with their unique wedging principle. They adjust *automatically* to compensate for valve body distortion—cinching tight, leak-proof closure.

The difference is in the fully revolving double disc, parallel seat principle of Darling valves. Just two plain, interchangeable no-pocket discs and two rugged wedges do all the work. Discs are completely free of pockets. Sediment and scale cannot collect to interfere with their free movement. No links or other devices are needed to hold the discs and wedges together. Any part can be quickly and inexpensively replaced without removing valve from the line.

It's easy to see why Darling valve users are money ahead because of the exceptional service made possible by the Darling design. That's why in plant after plant Darling gate valves are giving longer, trouble-free performance with minimum attention.

Darling features add up to gate valve service at its low-cost best! Send for the free Darling Valve Bulletin, today.

NOTE: Darling gate valves are made in a wide range of sizes, types and constructions, including solid and slotted taper-seat wedge types for all kinds of normal and corrosive services in pressures up to 1500 pounds.



Discs and seats are parallel. *Seats are forced out of parallel by body distortion but discs adapt themselves to give positive closure.* *Radiused face of wedge allows discs to adjust tightly against both seats.*

DARLING VALVE & MANUFACTURING CO.

Williamsport 1, Pa.

Manufactured in Canada by Sandilands Valve Manufacturing Co., Ltd. Galt 19, Ontario

HELPING AMERICA BUILD FASTER

Steel speed-up gets aid from Beechcrafts

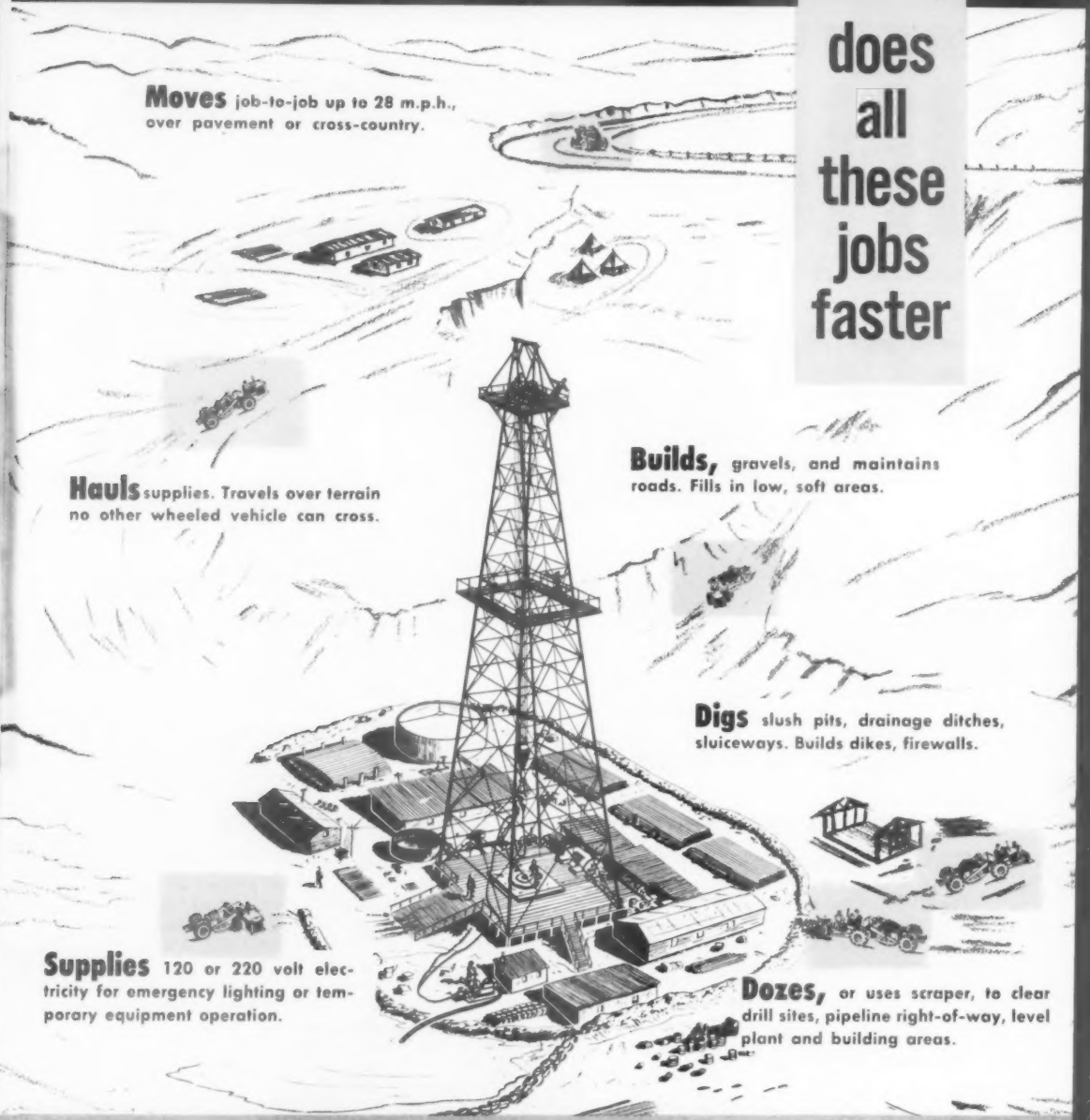
With steel production at a better-than-100% capacity, there's an even greater premium on executive *time*. This is why company-owned Beechcrafts serve leading steel companies daily—cutting travel time as much as 75%! Executives know complete mobility, give distant problems on-the-spot attention.

Wherever business is helping America build faster, you find Beechcrafts on the job. The two goals of defense production plus a healthy economy demand higher efficiency. Discover how you get more done—by Beechcraft. Call your Beechcraft distributor, or write to Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Handy dirtmover for oil field work

does all these jobs faster



Moves job-to-job up to 28 m.p.h., over pavement or cross-country.

Hauls supplies. Travels over terrain no other wheeled vehicle can cross.

Builds, gravels, and maintains roads. Fills in low, soft areas.

Digs slush pits, drainage ditches, sluiceways. Builds dikes, firewalls.

Supplies 120 or 220 volt electricity for emergency lighting or temporary equipment operation.

Dozes, or uses scraper, to clear drill sites, pipeline right-of-way, level plant and building areas.

R. G. LeTOURNEAU, INC.

Peoria, Illinois

D TOURNAPULL prime-mover also powers interchangeable...

One man, with dozer and scraper-equipped D Roadster, becomes a complete "maintenance crew" for dirtmoving operations. This job-proved rig moves in or around any location at speeds up to 28 m.p.h. In most materials, it will self-load up to 6 cubic yards in less than a minute. Pusher-loaded by another "D" or by a tractor, it will heap 7 cubic yards in 30 to 40 seconds. When dozing, Tournapull's blade handles over 1¼ yards. When snow-plowing, with V-plow substituted for dozer blade, it clears a path 9′ wide.

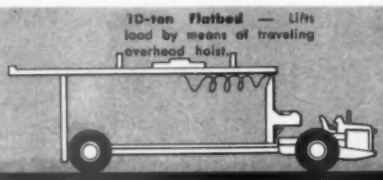
Not only will Tournapull handle this great variety of jobs, but it will handle them easier, faster and at lower cost than any other dirtmoving rig.

Big low-pressure tires, combined with power steer and torque-proportioning differential, enable the "D" to travel slippery saddleback roads or go through mud and sand that stalls ordinary trucks. Air-operated disc brakes have more area per wheel than big trucks have on all four. With 28 m.p.h. speeds, it moves 2 to 3 times as much dirt as larger, more expensive crawler-scraper combinations. Electric controls give you instant action. Operator simply flicks handy dashboard switches to steer, doze, load or unload . . . works faster, with less effort, to save important seconds on every dirtmoving cycle. It will pay you to learn what this rig can do for you . . . ask your LeTourneau Distributor for a demonstration on your operation!

Tournapull, Tournadozer, Tournamatic— Trademark Reg. U. S. Pat. Off. DP-58-OL

Building an access road in soggy terrain, Tournamatic differential transmits most power to drive wheel on firmest footing, enables Tournapull to "walk" through softest materials.

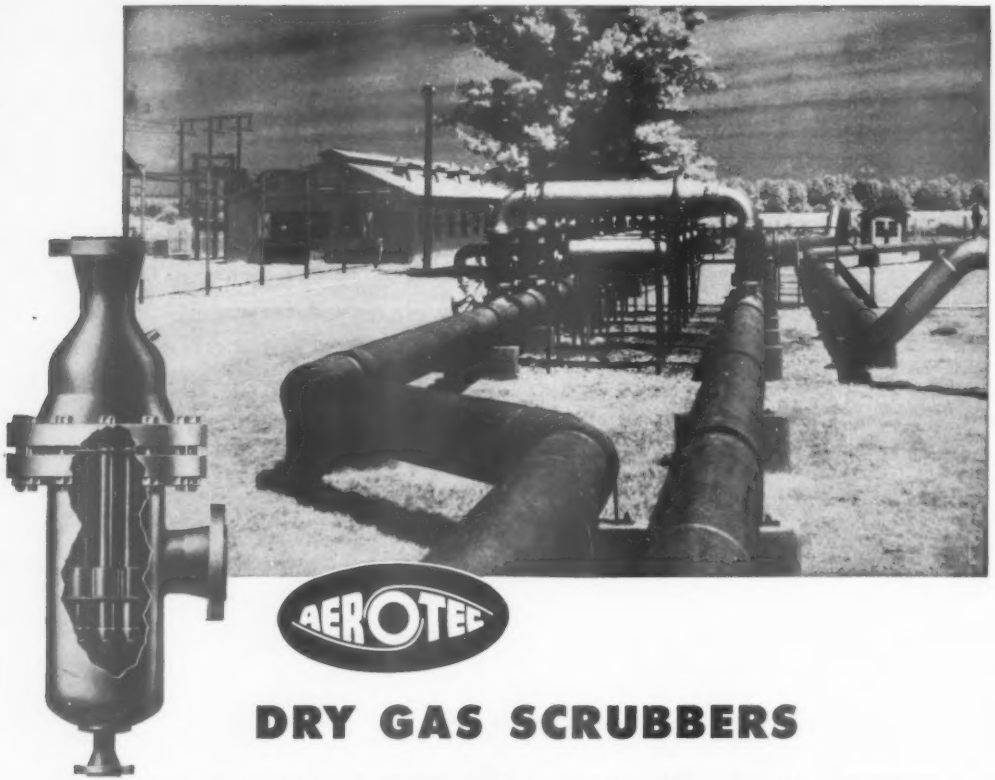
Tournapull's electrically-controlled blade cleans up scattered dozing jobs in a hurry. (For heavy-duty, full-time dozing, LeTourneau offers 186 h.p. Tournadozer with 2½-yd. blade and rubber-tired speeds to 19 m.p.h.)



10-ton Flatbed — Lifts load by means of traveling overhead hoist.

9-ton Rear-Dump — Turns around in radius of 12′4″, dumps electrically.

10-ton Crane — Carries full load anywhere. No outriggers needed.



AEROTEC

DRY GAS SCRUBBERS

protect compressors and reduce pipeline maintenance

Dusts and distillates in natural gas put an unnecessary drag on profitable pipeline operation. Aerotec Dry Gas Scrubbers get rid of these damaging impurities with high efficiency, thereby reducing maintenance to a minimum. This is a proven fact in well and pipeline installations across the country.

The Aerotec Scrubber, unlike conventional types, uses no liquid filtering medium. Hence, you eliminate carryover of elements that cause compressor wear. You also avoid other difficulties normally encountered with wet-bath scrubbing methods. The Aerotec units assure clean, *dry* gas that flows freely and saves on repair and maintenance costs.

Basis of this efficiency is a unique method of scrubbing gas by the use of multiple, small-diameter tubes. Through the principle of dry separation by centrifugal force, foreign solids and liquids are precipitated, leaving the gas clean and dry.

Simplified piping permits easy installation of the compact, lightweight Aerotec Dry Gas Scrubber. Standard units up to 100,000,000 SCFD are available, with larger capacity requirements met by manifolding. For technical data and engineering assistance in selecting the Aerotec Scrubber best suited to your gas-cleaning needs, call or write our representatives today.

Project Engineers **THE THERMIX CORPORATION** Greenwich, Conn.

(Offices in 38 Principal Cities)

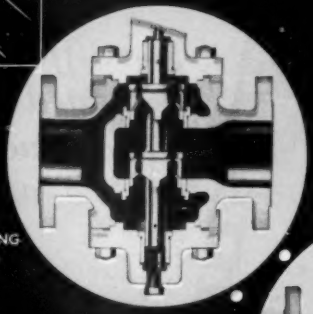
***Canadian Affiliates:* T. C. CHOWN, Ltd., Montreal 25, Quebec; Toronto 5, Ontario**

Manufacturers

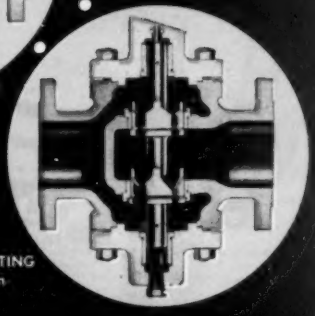
THE AEROTEC CORPORATION

GREENWICH, CONN.

QUICK SHIFT

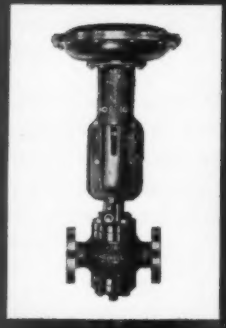


DIRECT ACTING
air to close



REVERSE ACTING
air to open

for easy field reversal of valve action



You can reverse the control action of the Honeywell Series 700 Valve by inverting the valve body and disc, and turning the travel indicator plate to its reverse side. It can be done in the field . . . easily and quickly, without extra parts or complex adjustments.
The Honeywell Series 700 wide band proportional control valve comes in a full range of styles and sizes . . . has *all* the features you look for in a fine valve.
Write today for your copy of Bulletin 700-2.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 1906 Windrim Avenue, Philadelphia 44, Pa.

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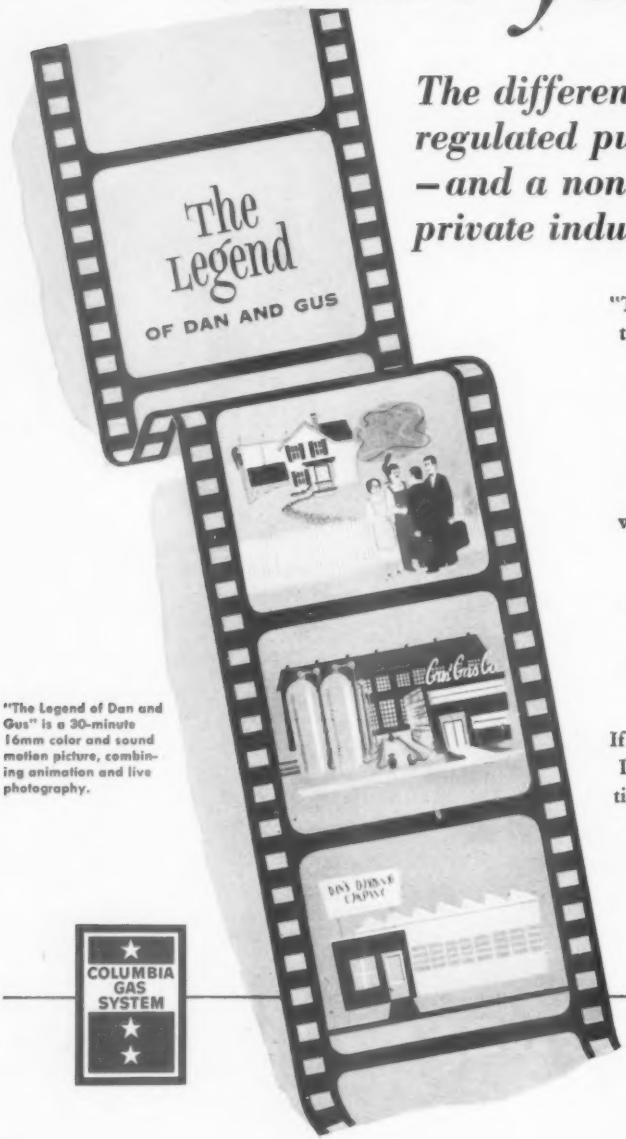
Honeywell
VALVE PRODUCTS

First in Controls

Now! *a film that shows you...*



The differences between a regulated public service company —and a non-regulated private industry.

"The Legend of Dan and Gus" introduces two young brothers to the U. S. business scene, together with the firms they founded—*Dan's Doorknob Company* and *Gus' Gas Company.*

In their own way, Dan and Gus are an American success story. They learn to weather economic cycles, material shortages, competition, expansion crises, and a host of other challenges. They learn first hand that regulated and non-regulated businesses are different, and each has its own problems that must be met in different ways.

If you would like to view "The Legend of Dan and Gus" or desire further information about it, write on your letterhead to: Director of Information, The Columbia Gas System, Inc., 120 East 41st Street, New York 17, N. Y.

"The Legend of Dan and Gus" is a 30-minute 16mm color and sound motion picture, combining animation and live photography.

COLUMBIA GAS SYSTEM

COLUMBIA GAS SYSTEM

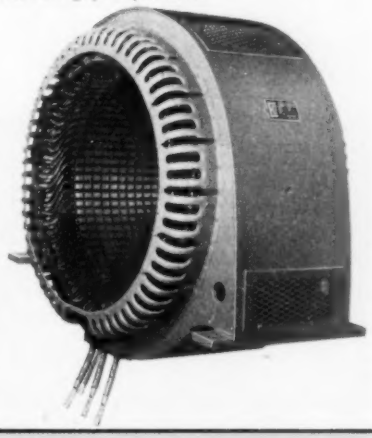
Here's built-in ruggedness!

ELLIOTT GENERATORS

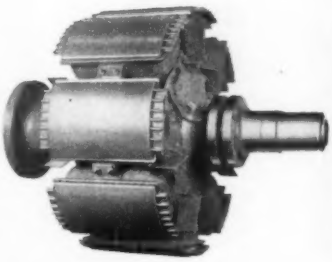
Synchronous, high-speed, 75-5000 KVA

HERE IS THE crackproof toughness of fabricated steel plate in stator, bearing brackets or bearing pedestals, jig-machined where required to insure close accuracy, and engineered in their fabrication for the extreme rigidity that permits of closest air gap . . . Here is the lasting strength of compressed laminations, riveted, in stator spider — of silver brazing damper bars to end ring segments — of positive lashing of field coils . . . Here is enduring insulation that defies the toughest conditions . . . Here is thoroughly dependable electric power.

THE STATOR coils are lashed and blocked between turns, then sprayed with black, air-drying varnish, and two coats of clear marine varnish. Heavy steel frame end feet are welded to frame end plates, then face milled and drilled for dowels and bolts. Adjusting screws in the frame feet provide close vertical air gap adjustment.



THE SPIDER is pressed or shrunk on the shaft, and keyed. Poles with dovetail projections fit dovetail slots in spider, are wedged with opposing tapered wedges, which are tack-welded after overspeeding to insure ultimate tightness. Rigid, strong steel collector rings are shrunk on an insulated bushing pressed on the shaft. Field leads are clamped in place with cap screws and lock washers.



Full details on Elliott Synchronous Generators (High-Speed) in Bulletin PB2400-1. On request.

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R2-9

Four years maintenance-free service on Propane at 300 pounds pressure—temperatures from 60° F. above to 40° F. below zero . . .

. . . THAT KIND OF PERFORMANCE IS AN "OLD STORY" WITH . . .

HOMESTEAD *Lever-Seald* VALVES

Propane at 300 lbs. pressure, minus 40° F.

A prominent Mid-Western Oil Refiner* installed a 3", flanged, cast-steel, straightway HOMESTEAD Lever-Seald VALVE on Propane service at 300 lbs. working pressure with a temperature range from 60° F. above to 40° F. below zero. After four years service, with no maintenance except repacking, the valve still held tight.

That sold him—proved to him that HOMESTEAD Lever-Seald VALVES are his "best buy!" Today he is using Lever-Sealds on Propane and on drag lines from stills, another difficult service.

HOMESTEAD Lever-Seald VALVES really lick tough problems, not only in the Processing Industries, but in scores of other industries as well. And wise buyers know that savings effected on difficult services are made in even greater degree on "every day" air, steam, water, gas and oil jobs.

Why don't *you* prove to *your own* satisfaction that HOMESTEAD Lever-Seald VALVES are *your* "best buy," by putting some to work in your plant?

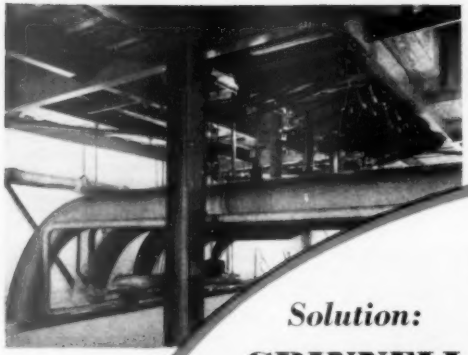
**Name on request.*

Drag line from still handling oil and tar at 800° F., 100 lbs. pressure.

For complete technical data and prices, WRITE FOR "VALVE REFERENCE BOOK No. 39." No obligation.

HOMESTEAD
VALVE MANUFACTURING CO.

P. O. BOX 403 — *"Serving Since 1892"* — CORAOPOLIS, PA.



Main steam piping at Salem Harbor Station of New England Power, 1000° F and 1450 psi, supported by Grinnell Constant Support Hangers.

Problem:

PIPING THAT GROWS...

Solution:

GRINNELL ENGINEERED HANGERS

Eight . . . nine . . . ten inches of thermal deflection! That's not a bit uncommon in today's high temperature, high pressure systems. Very hard-to-come-by, though, is the skill necessary for dealing successfully with suspension problems resulting from *"piping that grows"* . . .

Large manufacturing facilities, expert technicians, and a lot of down-to-earth practical knowledge are needed.

Grinnell is America's No. 1 supplier of pipe hangers and supports, because Grinnell combines modern manufacturing with expert background knowledge gained during a century of piping specialization. Grinnell has developed hangers and supports for *every* piping need, from the simplest to the most complex. Grinnell, and Grinnell alone, can offer these advantages:

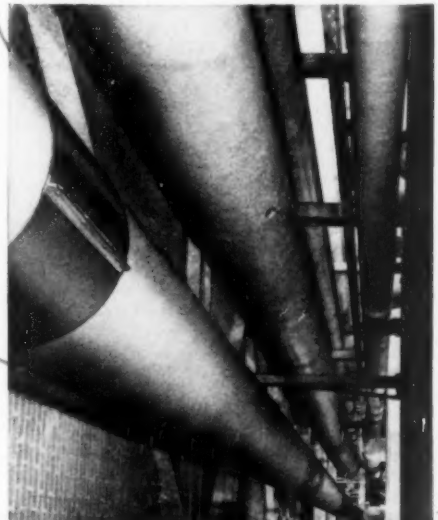
- Complete "start-to-finish" production facilities—including research, design, manufacturing, engineering and field service.
- Practical experience in every type of piping gained during the past 100 years.
- Coast to coast distribution—enabling "out of stock" purchases, anywhere.

Grinnell is always ready to cooperate with engineers and architects in the preparation of pipe suspension specifications. Call Grinnell for pipe hangers and supports.

GRINNELL MODEL L CONSTANT SUPPORTS maintain full safety factor in high temperature, high pressure systems. 3 physical structures accommodate maximum travel requirement of 2½, 5 and 10 inches; 16 sizes collectively cover numerous load ranges between 141 and 19,530 lbs.

GRINNELL PRE-ENGINEERED SPRING HANGERS— maximum variation in supporting force per ½" of deflection is 10½% of rated capacity — in all sizes. 16 sizes available from stock — load range from 74 lbs. to 9000 lbs.

GRINNELL VIBRATION CONTROL AND SWAY BRACES— dampen vibration, oppose pipe sway and absorb shock. 3 sizes give full deflection forces from 200 to 1800 lbs.; have initial precompressed spring forces from 50 to 450 lbs. respectively.



GRINNELL

AMERICA'S #1 SUPPLIER OF PIPE HANGERS AND SUPPORTS

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

See for Yourself WHY

Gates Vulco Ropes Wear Longer

Twelve oil wells of the Pace Petroleum Co. near East Comanche, Okla., are pumped from a central power house. When the crankshaft of the engine broke, a high speed engine was chosen to drive the bandwheel. Using the old engine bed and bearings to mount a jackshaft, the owners installed the inexpensive Gates Vulco Rope drive shown and connected the new engine without major changes in the plant arrangement.

Make this Simple Test

Take any V-belt that has *straight* sides. Bend that V-belt while you grip its sides between your fingers and your thumb. You will *feel* the sides of the belt *bulge out*—as shown in figure 1-A, below.

Clearly, that outbulge forces the sides of the belt to press *unevenly* against the V-pulley —and this concentrates the *wear* where the bulge is greatest.

Now, make the same test with the belt that is built with the Concave Sides—the Gates Vulco Rope.

Figures 2 and 2-A show clearly what happens when you bend a Vulco Rope. Instead of *bulging*, the precisely engineered Concave Sides merely *fill out* and become perfectly straight. This belt, when bent, precisely fits its sheave groove.

Because there is *no bulging*, the sides of the Gates Vulco Rope always grip the full face of the V-pulley *evenly* and therefore wear *uniformly*—resulting in *longer belt life* and *lower belt costs for you.*

When you buy V-belts, be sure to get the V-belt with the Concave Sides – – the Gates Vulco Rope!

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

What Happens When a V-Belt Bends

Straight-Sided V-Belt

How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

Gates Vulco Rope with Concave Sides

The Concave Sides Fill Out to a Precise Fit in the Sheave-Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley — Uniform Wear — Longer Life!

CS-528-E

Gates VULCO ROPE DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

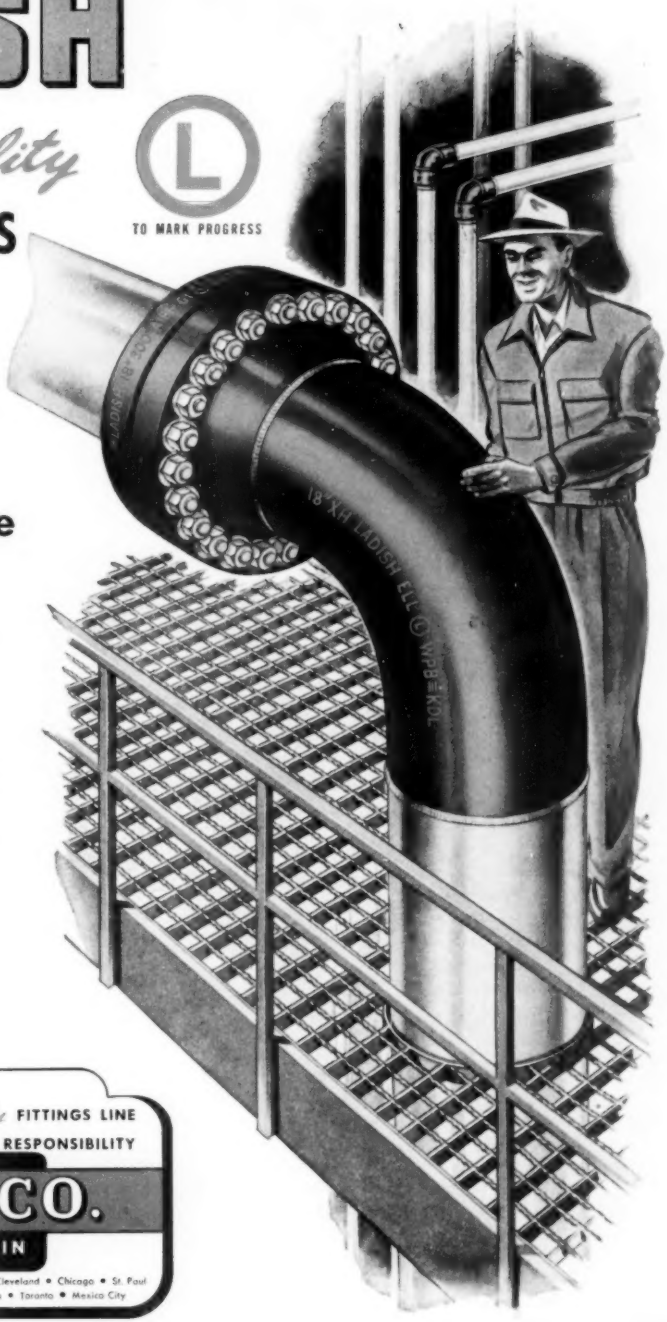
V-Belts — Hose
Molded Rubber Goods
for industry
World's Largest Maker of V-Belts

LADISH

Controlled Quality

PIPE FITTINGS

TO MARK PROGRESS



metallurgically sound for maximum service

Sound metallurgy . . . the result of unsurpassed facilities and advanced laboratory controls . . . provides the maximum of dependability in Ladish Controlled Quality fittings. Every phase of metal quality . . . composition, structure and physical properties . . . is continuously safeguarded—and certified proof of metallurgical integrity is available to users of Ladish fittings.

THE COMPLETE *Controlled Quality* FITTINGS LINE
PRODUCED UNDER ONE ROOF...ONE RESPONSIBILITY

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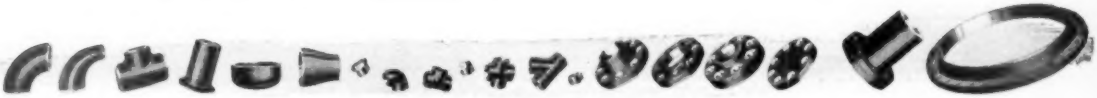
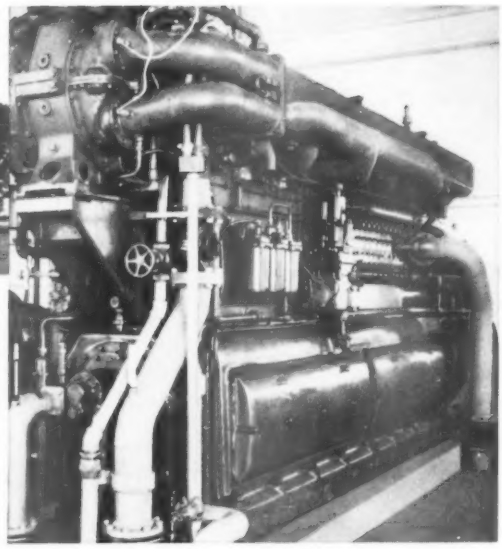


165,000 hours of service completed by 28 Alco Diesels at 98½% availability

for Gulf Refining Company



Twenty-two years ago, Gulf Refining Company installed 28 Alco Diesel Engines on its new, 700-mile Tulsa-to-Spencerville Junction pipeline. Today, those 28 Alco Diesels have completed more than 165,000 hours of service and are operating at 98½% availability. And since 1941, when the output of the line was greatly increased, they have been in actual service an average of 97% of the time.

Pumping station superintendents throughout the United States and Canada specify Alco Standardized Diesels because of this kind of *proved* dependability——and because of these economy features:

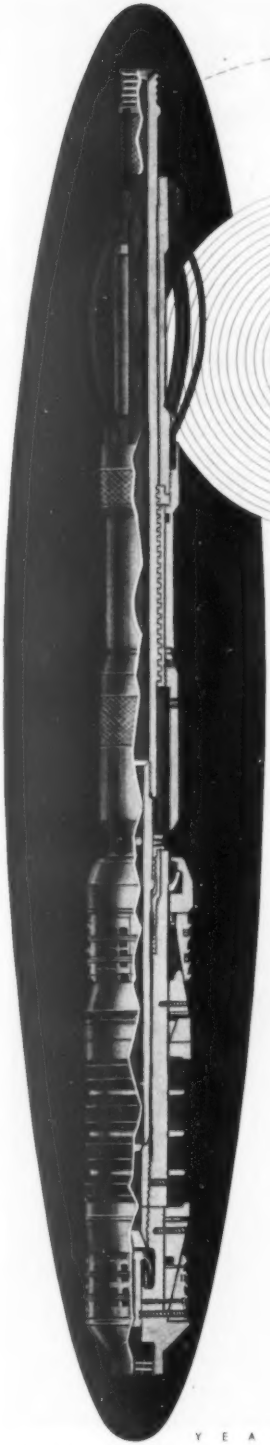
- **Compactness**—for lower construction costs
- **Higher Engine Efficiency**—for lower fuel costs
- **Medium Speed**—for lower auxiliary equipment costs
- **Flexible Power Range**—for lower expansion costs

For the complete story on Alco Diesel Engines, contact your nearest American Locomotive Company Sales Office. You will find them in New York, Beaumont, Chicago, Cleveland, Houston, Kansas City, San Francisco, Schenectady and St. Louis.

ALCO DIESELS

THE MARK OF MODERN ENGINEERING

AMERICAN LOCOMOTIVE COMPANY



HALLIBURTON'S DM AND DC SQUEEZE PACKERS

PINPOINT

DEEP WELL SELECTIVE CEMENTING

DEEP WELL SELECTIVE CEMENTING demands the *on target* accuracy and mechanical dependability of Halliburton DM and DC Squeeze Packers. The many advantages offered by these famous packers, success-proved in thousands of deep wells, deserve your serious consideration.

COMPLETE CIRCULATION CONTROL... The exclusive Halliburton circulating valve contains no ports, gives uninterrupted free circulation with positive control in either direction.

POSITIVE SETTING BY ROTATING... You simply rotate the tubing before picking up! Halliburton's improved slips automatically release from their safety-lock position and hold securely in any casing with minimum danger of distorting old or lightweight casing.

DEPENDABILITY UNDER EXTREME CONDITIONS... Halliburton DM and DC Squeeze Packers function smoothly in spite of extreme pressures, high temperatures, and heavy muds. The tubing and circulation valve are easily freed after setting – no threads to unscrew after squeezing. Two fluid seals prevent cement from escaping through the top.

Both are identical in design. Halliburton DC is in constant demand and highly recommended for permanent bridge plug use. Either one is built for all squeeze jobs and temporary bridges.

DM (high strength Drillable Magnesium alloy)
DC (high strength Drillable Cast iron)

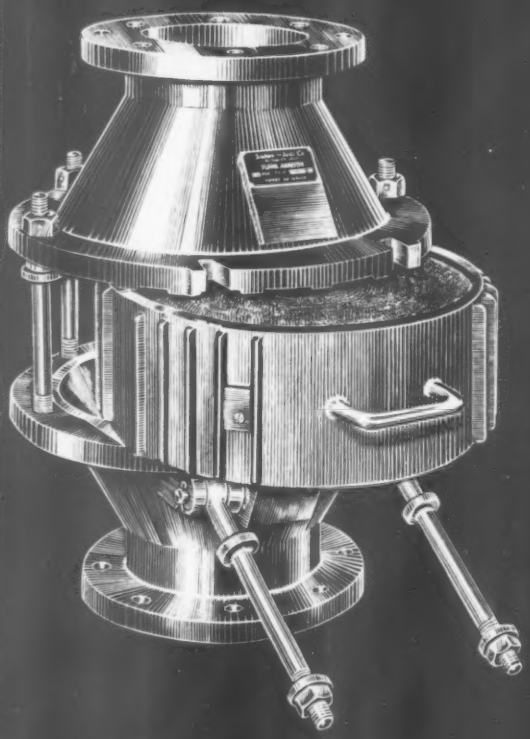
For the most satisfactory deep well selective results, get the best squeeze packers that money can buy! Contact your nearby Halliburton Representative... Or write Halliburton Oil Well Cementing Company, Duncan, Okla.

HALLIBURTON

YEARS AHEAD IN SQUEEZE CEMENTING

YOU SELECT THE METALS

SHAND & JURS' "Flamex" is available in any combination of materials. There is a "Flamex" that can be supplied to meet any special requirement in the Oil, Chemical and Petro-Chemical Industries. This means that "Flamex" used in the same manner and places as standard flame arrestors will provide longer useful life, lower maintenance cost and in the long run greater safety.



Designated by S&J Figure ST-4300, "Flamex" utilizes a spirally wound tube bank of alternate flat and corrugated sheets around a solid core of like material. The passages thus formed run parallel with the gas flow. End section faces are precision ground assuring positive tight seat, a must for maximum safety. One or more clamp bolts swing down for access to the bank, and the other bolts are used to jack the ends apart for easier bank removal.

S&J

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To men who seldom take valves for granted. . .

The flow of the life blood of the petroleum industry is controlled by valves—valves of every size and description.

Walworth compounds 110 years of experience with steel, iron, bronze, and special alloys to make valves and fittings favored by many who influence buying in the oil and gas industries.

Walworth makes approximately 47,000 different items. Your near-by Jones & Laughlin Supply store stocks Walworth valves and fittings to fit all conventional and many special requirements, and we have qualified engineers ready to assist in the solution of your valve problem.

We like to do business with men who seldom take valves for granted.

WALWORTH

Among the latest Walworth achievements is the Type 49 Steel Pipe Line Gate Valve in sizes from 2 to 30 inches, with a through-port, full-area, conduit-type passageway. Ask for illustrated circular.

AMERICA NEEDS SCRAP TO MAKE MORE STEEL

Jones & Laughlin Supply Company

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88 STORES • 19 OFFICES • 9 RESIDENT SALESMEN

General Offices: TULSA, OKLAHOMA

Subsidiary of Jones & Laughlin Steel Corporation

How to keep a "Main Line" on schedule!

Gas main lines are increasingly in demand today for city gas distribution. And delivery of line pipe *on schedule* is essential to expedite new installations.

A large share of Kaiser Steel's medium diameter line pipe is used in city distribution lines—all of it delivered *on time*.

This same dependable delivery is available to users of line pipe in the western two-thirds of the United States.

Add to this Kaiser Steel's *uniform quality* and *wide range of sizes* and it's clear why—

It's good business to do business with

Kaiser Steel

KAISER STEEL PIPE SPECIFICATIONS • All pipe manufactured to latest A.S.T.M. and A.P.I. specifications

Type	Diameter	Length	Wall Thickness	Shipping Point
Continuous Weld—Threaded and Coupled	½" to 4" nominal I.D.	Uniform 21'	Standard	Fontana, Calif.
Continuous Weld—Plain End	2⅜" to 4½" O.D.	Up to 40'	Standard	Fontana, Calif.
Electric Resistance and Fusion Weld—Plain End	8⅝" to 20" O.D.	Up to 40'	.188" to .500"	Napa, Calif.—Basalt-Kaiser
Electric Resistance Weld—Plain End	5⅛" to 12¾" O.D.	Up to 55'	.188" to .375"	Fontana, Calif.
Electric Fusion Weld—Expanded—Plain End	22" to 30" O.D.	Up to 40'	.188" to .500"	Napa, Calif.—Basalt-Kaiser

Prompt, dependable delivery at competitive prices • KAISER STEEL CORPORATION Los Angeles, Oakland, Seattle, Portland, Houston, Tulsa, New York

What happens when you order STURDYBILT oil field housing?

1. You select from the many plans available for houses, warehouses, etc.
2. You sign *one* purchase order for any number of buildings you need.
3. Your buildings, in sections, are placed on trucks at the factory.
4. Your buildings are transported as quickly as the truck can roll to your site.
5. Workmen erect the buildings in days instead of weeks.
6. In a matter of a few weeks from the time your order is signed, your buildings are ready for occupancy.

Write for Complete Information

MANUFACTURERS OF SPECIAL MILLWORK: DISTRIBUTORS OF CURTIS WOODWORK; JOHNS-MANVILLE BUILDING MATERIALS

STURDYBILT

PREFABRICATED, DEMOUNTABLE HOUSES

SOUTHERN MILL & MANUFACTURING CO. • TULSA, OKLAHOMA

STURDYBILT HOUSES COMPLY WITH COMMERCIAL STANDARD CS125 OF THE NATIONAL BUREAU OF STANDARDS FOR PREFABRICATED HOMES

Proof of Better Performance

CHECK THESE RESULTS OF A MALONEY-CRAWFORD DRICOLD UNIT WITH YOUR OWN FIGURES

Data taken in tests conducted Monday, August 4, 1952 to determine capacity of unit and well.

August 4, 1952						
Time	9 AM	10 AM	11 AM	12 Noon	1 PM	2 PM	2:45 PM
Well Press.-psi	2350	2550	2410	2150	2150	2000	1825
Well Temp. °F.	134	131	131	134	136	137	138
1st Stage Pressure-psi	2300	2550	2375	2050	2090	1925	1700
Temp. of (F. B.)	78	76	77	79	78	80	80
Dist. out °F.	66	64	66	68	68	70	72
2nd Stage Pressure-psi	740	700	720	730	730	740	760
Foxboro °F.	88	87	87	87	88	88	90
Bath of (Thermo.)	87	87	84	86	88	88	82
Dist. out °F.	88	85	84	86	87	87	88
Expansion °F.	24	19	21	28	26	34	42
Gas out °F.	28	20	25	32	31	38	46
Coil out °F.	112	107	109	114	117	120	122
Meter Run	90	82	83	93	97	106	108
Temp. °F.	8	4	5.85	8.1	8.1	8.95	9.9
Dif. (in water)	670	660	665	665	665	665	670
Static Press.							
Flow Rate mmcf-day	6.2	4.32	5.85	8.1	8.1	8.95	9.95
Dew Points						40	50
Hydrocarbon °F.	4	22	31	36		12	19
Water °F.		4	5	5			
Lbs. Water per mmcf		2.9	3.0	3.0		3.8	5.4
Gage Pressure	700	700	710	710		720	720

The above test was made and recorded by a major oil company. The Maloney-Crawford installation is a 10 million cubic feet per day dehydration unit which did not approach its actual capacity limit with 9.5 million cubic feet flow on the test. The well was unusually high in temperature and the flowing pressure at the higher flow rates was less than would normally be considered sufficient pressure for cold separation.

See a Maloney-Crawford representative or write for detailed information on how a Dricold unit can solve your problem.

MALONEY CRAWFORD

MALONEY-CRAWFORD TANK & MFG. CO.

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION MEMBER

FACTORY AND GENERAL OFFICE: 38 North Peoria—Box 659—Tulsa, Oklahoma

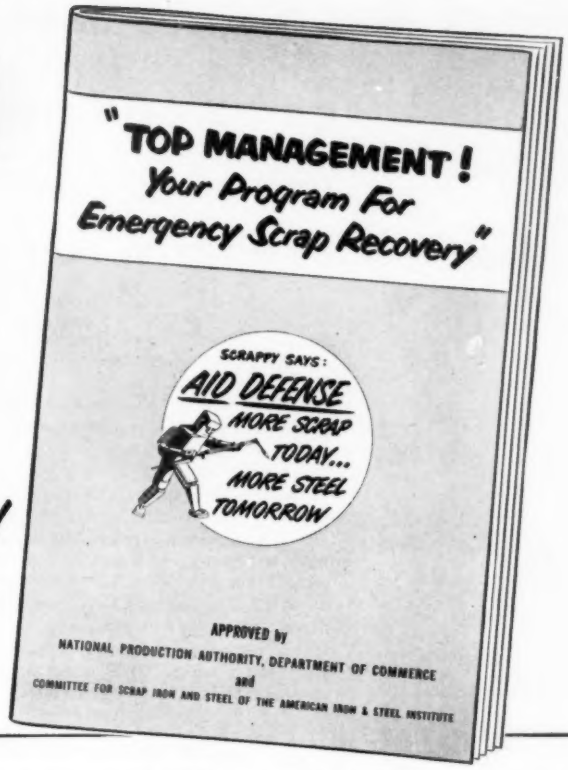
EXPORT REPRESENTATIVE: Baird Lines, 420 Lexington Avenue, New York, N. Y.

CANADIAN REPRESENTATIVE: Maloney-Crawford of Canada, Ltd., Box 4128, South Edmonton, Edmonton, Alberta.

TEXAS PANHANDLE REPRESENTATIVE: Atlas Tank Co., Pampa, Texas

What YOU can do... Must do

to ease the critical iron and steel scrap problem


"TOP MANAGEMENT! Your Program For Emergency Scrap Recovery"
SCRAPPY SAYS:
AID DEFENSE
MORE SCRAP TODAY...
MORE STEEL TOMORROW
APPROVED by
NATIONAL PRODUCTION AUTHORITY, DEPARTMENT OF COMMERCE
and
COMMITTEE FOR SCRAP IRON AND STEEL OF THE AMERICAN IRON & STEEL INSTITUTE

It's a problem calling for the assistance of every thoughtful business man—now.

Unless the steel mills get more scrap . . . furnaces may have to be shut down.

Shut down—at a time when our armed forces need more and more equipment . . . when civilian demands for steel are greater than ever . . . when our economy is fighting desperately against inflation!

You Can Help. Yes . . . regardless of the business you're in . . . you're in the scrap business, too.

If you're in the steel-fabricating business, you have extra *dormant* scrap to be added to your *production* scrap.

If you're in any other business, you surely have idle metal that will do you—and America—more good being fed into furnaces than cluttering up your premises.

Write for Suggestions. The booklet shown here tells how to set up a Scrap Salvage Program with least amount of effort and minimum interference with your regular operation. It tells where to look for scrap, what to do with it when you get it.

You are urged to send for the booklet now. Use the coupon.

FACTS ABOUT SCRAP SALVAGE

Steel production	1950 — 97,800,000 net tons
Estimated capacity	1952 — 119,500,000 net tons
Purchased scrap used*	1950 — 29,500,000 gross tons
Estimated purchased scrap requirement*	1952 — 36,200,000 gross tons

*All consumers

Where will the extra tonnage come from? Mostly from your *dormant* metal—obsolete machines and structures, tools, jigs, fixtures, gears, wheels, chains, track.

NON FERROUS METAL NEEDED, TOO:

A PUBLIC SERVICE PROJECT — THE ADVERTISING COUNCIL

This advertisement is a contribution, in the national interest, by

THE OIL AND GAS JOURNAL
TULSA 1, OKLAHOMA

Advertising Council
25 W. 45th St.
New York 19, N. Y.

Please send me a copy of the free booklet: "Top Management: Your Program for Emergency Scrap Recovery".

NAME.....

COMPANY.....TITLE.....

ADDRESS.....

CITY.....ZONE.....STATE.....

On this Falk Speed Increaser

gears and bearings never go "wanting" for properly cooled lube oil

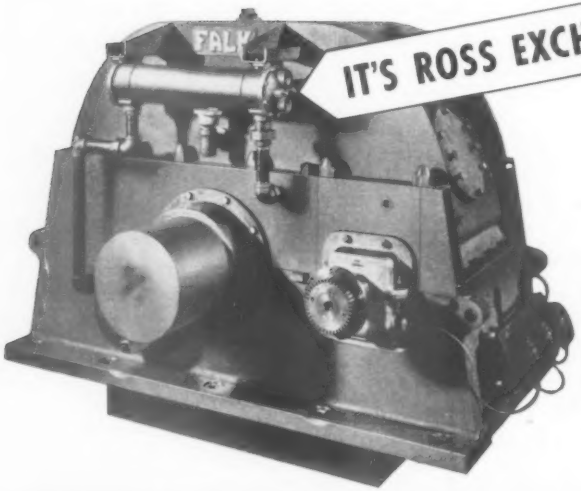
For adequate lubrication at most effective oil temperatures, external coolers are frequently furnished with Falk High Speed Gear Units.

The speed increaser shown, which is used in a fuel oil and gasoline pipeline pumping station, is typical. In addition to the integral water-jacket cooler in the cover, this Falk unit, like numerous others, comes equipped with a compact, Ross Type BCF Exchanger. In this way, gears and bearings never go "wanting" for sufficient lubrication at the right temperature.

The durable all-copper and copper alloy construction that spells out l-o-n-g l-i-f-e, and the pre-engineered, fully standardized designs that provide unrivaled benefits in time and cost, have made the Ross Type BCF Exchanger the standard selection of most original equipment manufacturers today.

For your diesels, compressors, turbines or whatever machines you make, the Ross "BCF" is the exchanger you should know all about. Bulletin 1.1K5 gives the major facts. Write.

KEWANEE-ROSS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
1417 WEST AVENUE • BUFFALO 13, N. Y.
In Canada, Horton Steel Works, Limited, Fort Erie, Ont.



IT'S ROSS EXCHANGER EQUIPPED

ROSS
EXCHANGERS

Serving home and industry

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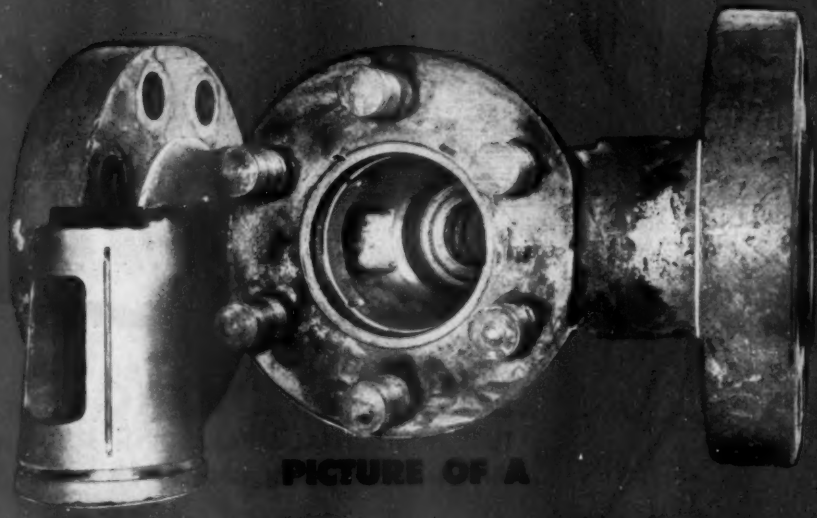


PICTURE OF A

Nordstrom Merchrome Coated *Mud Line Valve*

After 100,000 feet of drilling at pressures up to 3000 lb

Here is a typical case history of a Nordstrom Merchrome coated mud line valve—

After 100,000 feet of drilling with pressures up to 3000 lb it was disassembled for inspection. As the unretouched picture shows, the plug and body seating surfaces were completely intact. The valve was cleaned and put back into service with no repairs.

Here's another case history—

One 4-inch Fig. 22844 Nordstrom Merchrome coated mud line valve was used in two different Texas fields with 188,984 linear feet of hole drilled and a total of 4953 pumping hours. Then it too was disassembled, cleaned and put back into service without repair.

Nordstrom mud line valves are armored against the destructive action of drilling mud at high pressures. Merchrome hard facing is welded over the entire contact surface of body and plug. Flow is straight through and seats aren't exposed.

The Nordstrom Hypreseal design is built to withstand pressures as high as 5000 lb **WOG** in mud line service.

There's a special Nordstrom Bulletin, V-201, describing Nordstrom Mud Line Valves. Write for your copy.

Rockwell Built Nordstrom Valves

Another ROCKWELL Product

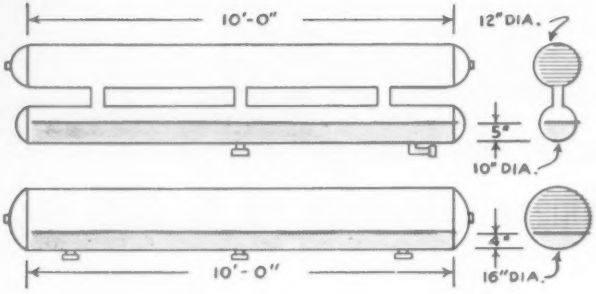
Lubricant Sealed to Keep Upkeep Down

ROCKWELL MANUFACTURING COMPANY

400 N. Lexington Ave., Pittsburgh 8, Pa.

Let's Face the Facts!

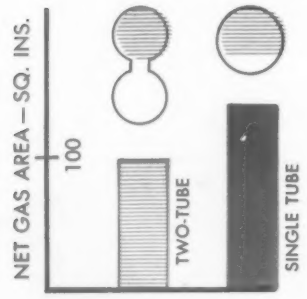
PARKERSBURG LARGE SINGLE TUBE HORIZONTAL SEPARATOR is a far better buy than two-tube designs.



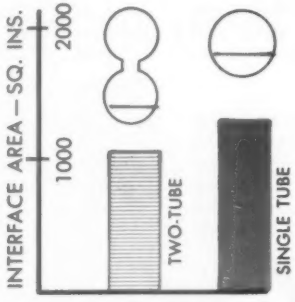
It is well established that the 3 basic factors of more efficient horizontal separator performance are:

1. Slower Gas Flow.
2. Greater Interface Area.
3. Longer Retention Time.

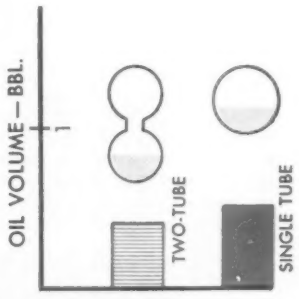
The accompanying drawings and charts, comparing a Parkersburg 16" Single Tube Horizontal Separator with a 12" two tube horizontal separator, clearly indicate how the typical Parkersburg Sepatator excels in these three factors . . . why it is a far better buy than comparably priced two tube horizontal separators of equal nominal rating.



Greater cross-sectional area for gas flow lowers the velocity of gas, permitting more effective natural separation of the entrained liquid.



Greater interface area allows the oil to attain equilibrium more quickly. Degassing is more thorough and complete . . . foam dissipates more rapidly over the larger interface area.



Longer retention time, resulting from more volume for the liquid allows the oil more time to give up its gas.

B219

PARKERSBURG

PRESSURE EQUIPMENT

HORIZONTAL AND VERTICAL SEPARATORS • HYRECO • HYDRACEPTER • SCRUBBERS • TREATERS • HEATERS

Manufactured in Houston, Texas

Make it *your* policy to use Tenamene 60 —the protection is worth many times the cost!

COPPER contamination costs you money by accelerating the rate of gum formation.

Its presence in gasoline, even in extremely low concentrations (1 ppm), necessitates the use of excessive amounts of gum inhibitor and can result in costly reruns.

Since copper contamination results from such minor occurrences as the corrosion of admiralty tubes in condenser bundles, its presence in gasoline is the rule rather than the exception.

Don't take chances with copper in your gasoline—deactivate with Tenamene 60. The cost is negligible—under most conditions the addition of 0.5 pounds of Tenamene 60 to 1000 barrels provides adequate protection—approximately 0.002 cents per gallon. Tenamene 60 can be added along with your regular gum inhibitor.

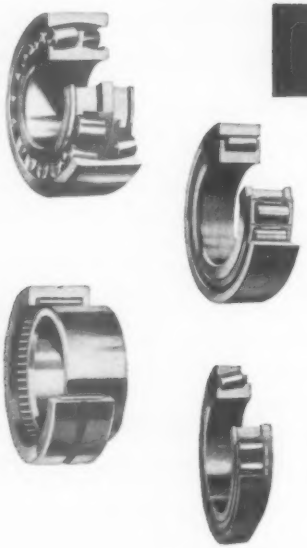
be safe - be sure - insure with -

Tenamene 60 EASTMAN COPPER DEACTIVATOR

SALES REPRESENTATIVES: New York — 260 Madison Ave.; Framingham, Mass. — 7 Hollis St.; Cleveland — Terminal Tower Bldg.; Chicago — 360 N. Michigan Ave.; St. Louis — Continental Bldg.; Houston — 412 Main St. **West Coast: Wilson Meyer Co.,** San Francisco — 333 Montgomery St.; Los Angeles — 4800 District Blvd.; Portland — 520 S. W. Sixth Ave.; Seattle — 821 Second Ave.

TENNESSEE EASTMAN COMPANY *Division of Eastman Kodak Company* **KINGSPORT, TENNESSEE**

which one?



There are a lot of conflicting claims about which type of anti-friction bearing is best. Actually, each type has its advantages. The problem is to decide which is best for the job at hand.

Torrington makes every basic type of anti-friction bearing. Our engineers know the relative advantages of each and have accumulated a fund of experience in their applications. Leading builders and users of mechanical equipment have learned to rely on Torrington for impartial recommendations.

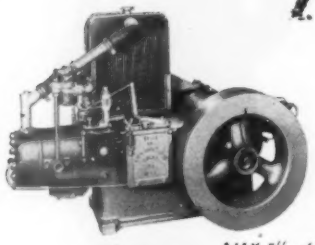
Next time *you* are selecting anti-friction bearings, let us know. We will be glad to work with you.

THE TORRINGTON COMPANY
South Bend 21, Ind. Torrington, Conn.
District Offices and Distributors in Principal Cities of the United States and Canada

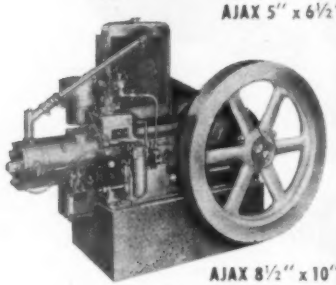
TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Straight Roller • Needle • Ball • Needle Rollers

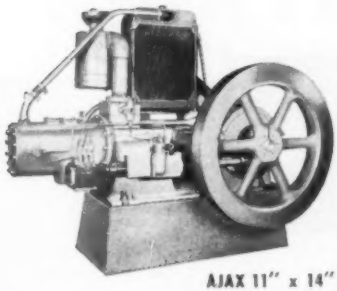
"BETTER GET AN Ajax"



AJAX 5" x 6½" WL



AJAX 8½" x 10" CMA



AJAX 11" x 14" CMD

FIRST IN THE FIELD

for sturdy dependability

The one best answer to your problems of gas engine operation, maintenance and durability is simply "Get an AJAX."

Here is the engine with a heritage of many years of easy starting, easy control, simple maintenance and long useful life — advanced and improved in every feature by AJAX *specialized* gas engine engineering.

Check around. Get the opinions of experienced AJAX owners. Then call your Supply Man for the complete story — soon!

AJAX IRON WORKS

Builders of Gas Engines • Steam Drilling Engines • Industrial Steam Engines

CORRY, PENNSYLVANIA

Oil Field Distributors: THE NATIONAL SUPPLY CO., PITTSBURGH, PA.
R. B. MOORE SUPPLY CO., INC., BOLIVAR, N. Y. • BETHLEHEM SUPPLY CO., TULSA, OKLA.

FOR Safety's SAKE...

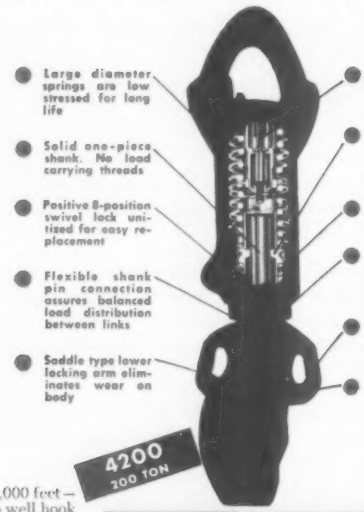
USE BJ SUPER-TRIPLEX HOOKS

SAFETY...STRENGTH...LONG SERVICE...ADAPTABILITY...

YOU'LL discover the solution to the toughest hook problem is a Byron Jackson Super-Triplex Hook. Over 24 years of experience manufacturing quality oil tools have gone into the design of the Super-Triplex line. This "know how" pays off in long, efficient service, built-in strength and safety, and greater adaptability of design of each BJ hook. Whatever your drilling requirements, you'll find Super-Triplex Hooks are built to withstand the heavy loads of modern drilling operations. There's a size for every type of drilling ... BJ engineered to fit your rig.

Here's how BJ makes better hooks:

- Only select, magnafluxed, heat-treated steels used
- 4:1 Safety Factor – Crews work better because they're safer
- Hooks rotate easily under all loads
- Close metallurgical supervision throughout manufacture
- "Floating Action" springs for easy handling of all loads
- All BJ hooks made to API standards



- Large diameter springs are low stressed for long life
- Solid one-piece shank. No load carrying threads
- Positive 8-position swivel lock unitized for easy replacement
- Flexible shank pin connection assures balanced load distribution between links
- Saddle type lower locking arm eliminates wear on body
- Sub-shank threads carry up thrust load of springs only
- Swivel ring accurately machined to seat shank when hook fully loaded
- Ball bearings 100% rated for each size hook
- Rugged housing supports load and protects working parts from dirt and grit
- Upper locking arms open downward for easy entrance of links
- Heavy body overhang takes swivel bail pounding

4200 200 TON

To 10,000 feet – Deep well hook designed for average 10,000 foot wells or maximum work load of 200 tons. Weight of hook 4,565 lbs.

4300 300 TON

Over 10,000 feet – Deep well hook designed to handle the heaviest strings of drill pipe and casing used in modern drilling. Weight of hook 5,800 lbs.

4125 125 TON

To 7,000 feet – Medium well hook designed for wells to 7,000 feet or maximum load of 125 tons. Weight of hook 3,045 lbs.

460 60 TON

To 5,000 feet – Shallow well hook is also available.

Byron Jackson Co.

MEANS ENGINEERED OIL TOOLS

OIL FIELD & INDUSTRIAL SPECIALTIES

For more detailed data, write for Super-Triplex Bulletin, or call your local BJ Oil Tool Representative.

WHY GASO PUMPS ARE FIRST IN THE FAVOR OF PIPELINE MEN

Series 2600—largest in the Gaso line. Designed to pump oil or water through long lines at pressures ranging from 475 to 1500 pounds per square inch. Rated capacity, 275 to 1000 barrels per hour.

Less Cost Per Barrel...

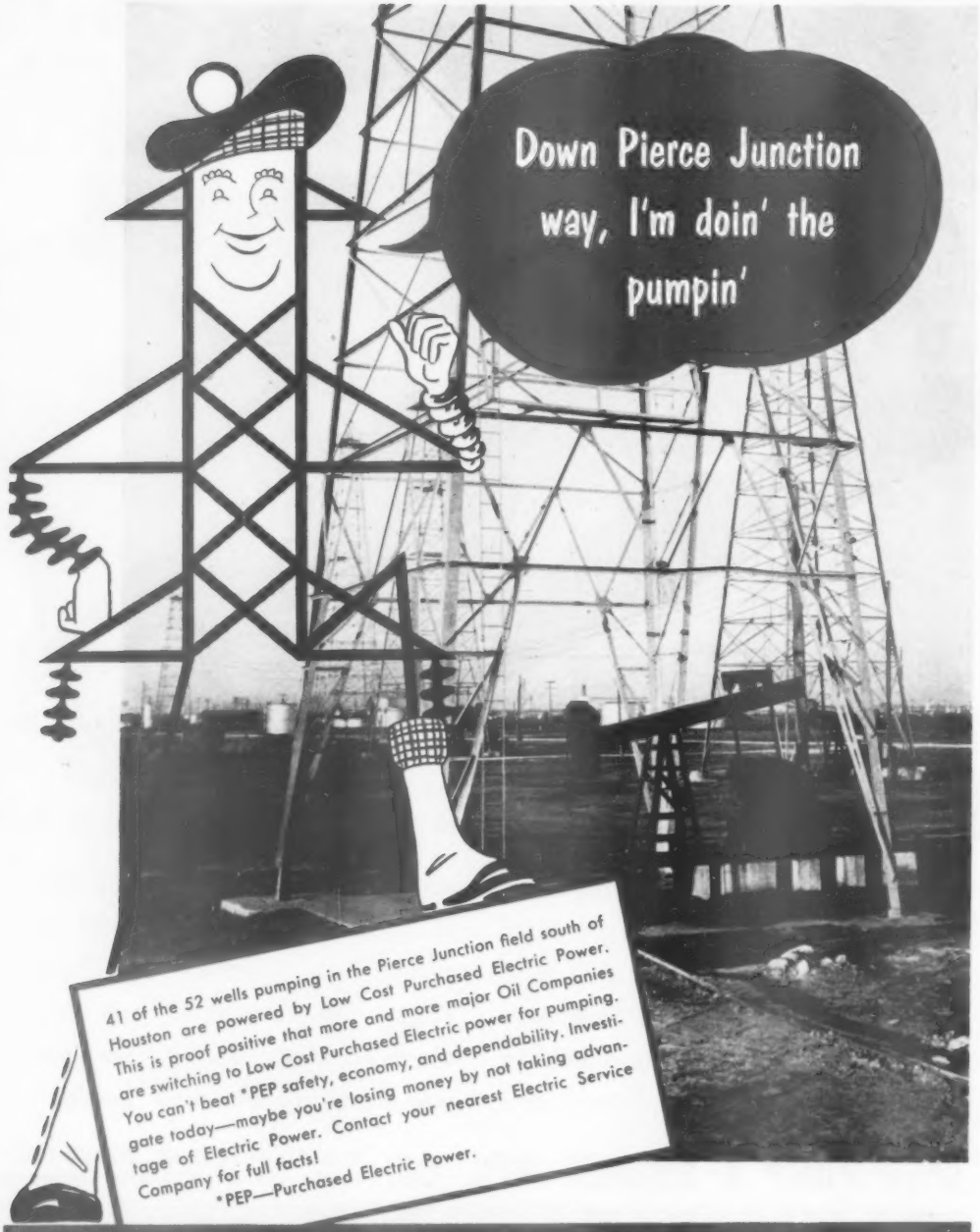
That's what counts in choosing pumps—the net cost per barrel of fluid pumped. The life of the pump, its operating cost and maintenance expense must all be considered in arriving at this figure. Take it from any veteran pipeline man—no pump in any field has a better record of economical performance than Gaso Pumps. We have made them that way for over 37 years. May we send you a copy of our latest catalog?

GASO PUMP & BURNER MFG. CO. 902 EAST FIRST ST., TULSA, OKLA.
EXPORT OFFICE: 149 BROADWAY, NEW YORK

Shreveport: W. L. SOMNER CO., 419 Lake Street • Los Angeles: 2529 Chambers St., Vernon • Western Canada: Lufkin Machine Co., Ltd., Edmonton, Alberta

GASO PUMPS

for every oil industry need



41 of the 52 wells pumping in the Pierce Junction field south of Houston are powered by Low Cost Purchased Electric Power. This is proof positive that more and more major Oil Companies are switching to Low Cost Purchased Electric power for pumping. You can't beat *PEP safety, economy, and dependability. Investigate today—maybe you're losing money by not taking advantage of Electric Power. Contact your nearest Electric Service Company for full facts!

*PEP—Purchased Electric Power.

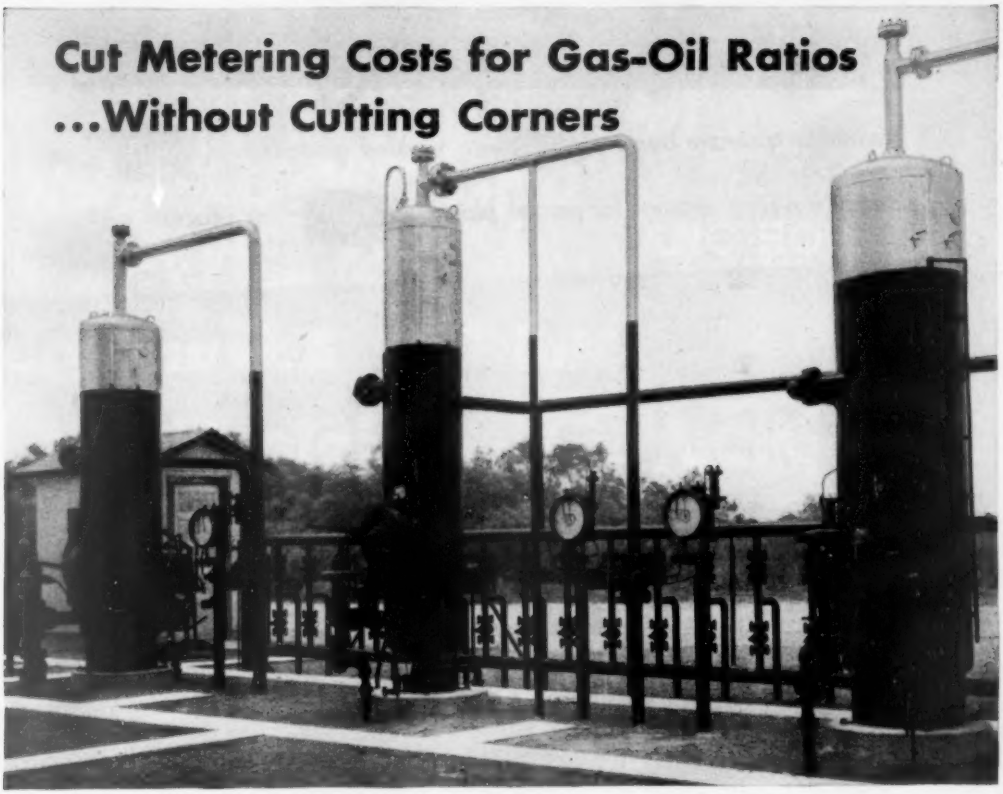
Petroleum Electric Power Association

ORGANIZED IN THE INTEREST OF GREATER SERVICE TO THE PETROLEUM INDUSTRY

CALL YOUR NEAREST ELECTRIC SERVICE COMPANY FOR MORE FACTS

OR ADDRESS YOUR REQUEST TO P. O. BOX 2771, DALLAS, TEXAS

Cut Metering Costs for Gas-Oil Ratios ...Without Cutting Corners



Measuring gas from Separator Batteries at Conoco Driscol Field, Benavides, Texas with 3 Foxboro Gas Flow Meters Type 4.

HERE'S THE WAY IT'S DONE

By taking advantage of the exclusive features built into Foxboro Flow Meters, you can cut meter inspection trips and recalibration to the bone . . . *and eliminate mercury losses completely.* You won't need to coddle these meters to get accurate records.

Foxboro Flow Meters are designed with a *unique straight-line linkage* that makes factory adjustments permanent. Their sustained accuracy is outstanding. Four to six years' service without recalibration isn't uncommon! In addition, floats of Foxboro Meters are *extra large* and have *extra long* travel. This means unequalled *power* . . . giving highest accuracy at the pen. *Sure-Seal Check Valves,* submerged in mercury, positively prevent mercury losses. And for freedom from friction and freeze-ups, Foxboro Pressur-Tite Bearings have never been equalled!

These are the reasons why experienced production men prefer Foxboro Flow Meters above all others . . . why you can cut metering costs without jeopardizing the accuracy of your records.

WRITE FOR Bulletin 460 for complete details.

The Foxboro Company, 6010 Neponset Avenue, Foxboro, Mass., U.S.A.

FOXBORO REG. U. S. PAT. OFF.

MONEY-SAVING FLOW METERS

Users of Piping

whether a simple bend *welded assembly* *or*

complete piping systems for power plant *or process*

get Multiple Advantages from MIDWEST Multiple Plants

ST. LOUIS, MO., No. 1

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Strategically located multiple plants and large scale operations have made it economically practicable for Midwest to develop much special pipe fabricating machinery and to conduct piping research that would be impossible under other circumstances. Multiple plants create a friendly rivalry between the organizations of these plants that advances the art of piping fabrication more rapidly than would otherwise occur. All these activities are reflected in better fabricated piping . . . in greater piping value per dollar. • Multiple plants help make Midwest the preferred source for prefabricated piping. 4909

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PIPING & SUPPLY
COMPANY, INC.

Main Office: 1450 South Second Street, St. Louis 4, Mo.

Plants: St. Louis, Passaic, Los Angeles and Boston

Sales Offices: New York 7—30 Church St.
Los Angeles 23—520 Anderson St.
Boston 27—326 First St.
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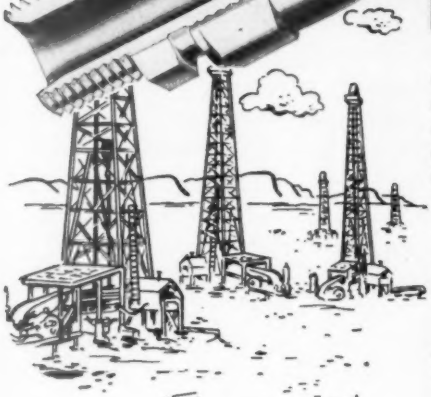
Tulsa 3—324 Wright Bldg.
Houston 2—1213 Capitol Ave.

PIPING FABRICATORS AND CONTRACTORS FOR MORE THAN 50 YEARS

Make Oil-Field Hose Assembly Easier, Faster, Safer

ANC HOR

. . . use Anchor Reusable Couplings with exclusive, patented features



Oil-field equipment manufacturers like Anchor two-piece reusable couplings. Oil-field equipment users like them, also, because you get more for your money with Anchor. You get an exclusive, patented design that saves you time and trouble — a grip that's safer, more dependable. Look at these advantages:

- **Assembly is easy and fast.** All you need is an oil can, a wrench, and a vise. It's that simple!
- **No expensive inventory** of prefabricated hose assemblies. Simply carry one coil in the sizes you use. Cut it to the lengths you need.
- **Anchor's exclusive patented grip** keeps hose assemblies on the job day-in and day-out — prevents leaks and dangerous blow-offs. Couplings can be used over and over again.
- **Downtime reduced.** One of your greatest expenses is cut — costly downtime in the field. Servicing can be performed immediately *without special tools.*
- **Streamlined coupling design** makes possible neat, efficient installations, even in confined spaces.

Anchor makes the most complete line of hydraulic hose assemblies and fittings available. That's why you can select the hose assembly that fits your needs — a hose assembly that lasts longer, performs better, handles easier. For best results, let Anchor go to work for *you.* Send coupon for additional information.

Attach coupon to your letterhead and mail today!

ANCHOR COUPLING CO. Inc.
FACTORY: Libertyville, Ill. • BRANCHES: Detroit, Mich., Dallas, Tex.

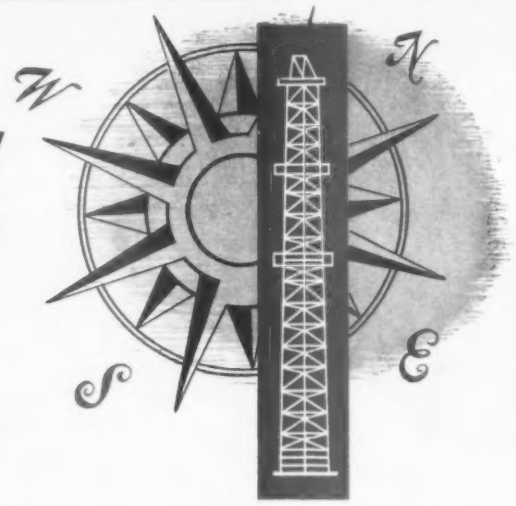
ANCHOR COUPLING CO. INC.
Dept. OG-102, Libertyville, Illinois

Yes, I'm interested in Anchor 2-piece reusable couplings. Send me more information.

NAME..... TITLE.....
COMPANY NAME .....
COMPANY ADDRESS .....
CITY ..... (...) STATE.....

integrity
Avondale
service...

famous in the Oil Industry



A company is not only famous for what it does—but also for how it does it! AVONDALE has constructed, repaired, and fabricated for the Oil Industry for many years. AVONDALE barges, towboats, tugboats, drilling barges, personnel launches and offshore drilling platforms have made a name for themselves within the Oil Industry as being tops in Quality and Performance. But that's not all! AVONDALE'S satisfied customers within the Oil Industry, both large and small companies, are proof that AVONDALE integrity, the manner in which AVONDALE carries out a job to the letter, to the complete satisfaction of the customer, is something that has made customers return to AVONDALE time and again. Couple those two words, Integrity and Service, and you have the ultimate in what the Oil Industry needs and wants from a company rendering Service to them . . . . . .

Offshore Drill Rig

125' MV "JOAN E."

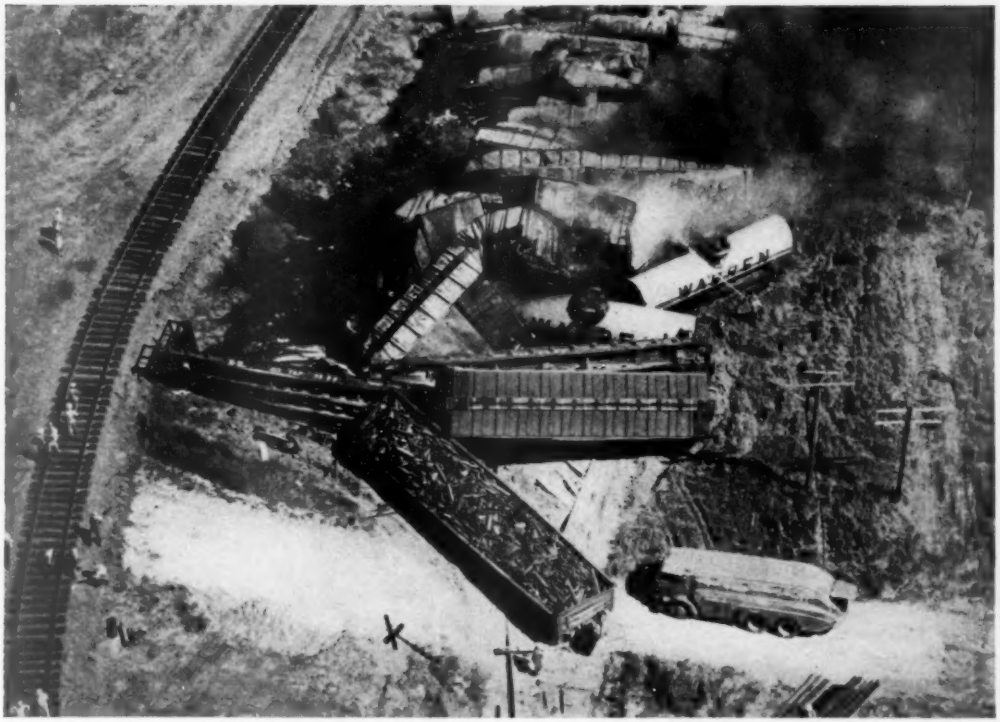
Oil Cargo Barge

AVONDALE MARINE WAYS, Inc.

MAIN PLANT: AVONDALE, LA. • QUICK REPAIR PLANT: HARVEY, LA.
SERVICE FOUNDRY DIVISION (SERVICE FOUNDRY): NEW ORLEANS, LA.

"PILE OF TIN CANS AND ORANGE CRATES"

...said a newsman at the scene.



YET—THE TANK CARS CAME THROUGH!

At Corsicana, Texas on May 10, 1952, 35 cars of a 62 car-train were derailed. Luckily, none of the five crewmen was injured in this accident which included two A.C.F. built, Warren Petroleum cars. Not a drop of a lading was lost due to the wreck —attesting to the sound construction of A.C.F., double-welded cars.

No, it was not just luck that from this mangled wreckage A.C.F. cars came through. The Warren Petroleum Company said later, "...the type of construction of this class of equipment speaks for itself."

And so it goes. Shippers everywhere are finding out what it means to ship in an A.C.F. built car. To find out the many advantages of A.C.F. All-Welded Tank Cars, write American Car and Foundry Company, 30 Church Street, New York, New York. Sales Offices in: Chicago • St. Louis • Washington Cleveland • Philadelphia • San Francisco.

A.C.F. **ALL-WELDED TANK CARS**

for Safe Delivery—

-it's UNIBOLT, all welded!

A cycling plant operator in Oklahoma makes good use of UNIBOLT Adjustable Wing Valves, Tees, and Couplings in a 3000 lbs. w.p. multiple-well gathering manifold. One section of the gathering system is shown in the above photograph.

Note that all of the fittings are provisioned for butt or socket welding. The use of Unibolt Couplings facilitated shop fabrication and testing of each unit before assembly in the manifold. The elimination of flanged connections substantially reduced the bulk and weight of the manifold without sacrificing strength, to say nothing of the time saved. Any unit in the manifold may be easily dismantled by simply releasing the Unibolt Couplings. The Adjustable Wing Valves provide accurate and dependable control of the production from each well, or a pressure-tight shut-off if needed.

THORNHILL-CRAVER COMPANY

P. O. BOX 1184 HOUSTON, TEXAS

NOW WATCH 'EM ROLL!

They're Coating with Quality-Controlled PITT CHEM *Modified* Enamel

Pipeline crews really *roll* when they start coating with Pitt Chem Modified Enamel. That's because every ton of this impervious protective coating provides the same peak application characteristics and excellent bond as the last. Pitt Chem Modified Grade heats up faster, flows better from kettle to pipe and coats more pipe per ton because of its consistent top quality.

As a basic producer, we control every step of production from coal to finished coating—in a plant designed *exclusively* for manufacturing coal tar coatings. And because we're basic, you can also depend on Pittsburgh Coke & Chemical for *deliveries as scheduled.* More product information, technical data and field application assistance, when needed, are yours for the asking.

★ Standard Grade Tar Base Enamel
★ Modified Grade Tar Base Enamel
★ Plasticized Grade Tar Base Enamel
★ Cold Applied Tar Base Coatings

PROTECTIVE COATINGS DIVISION

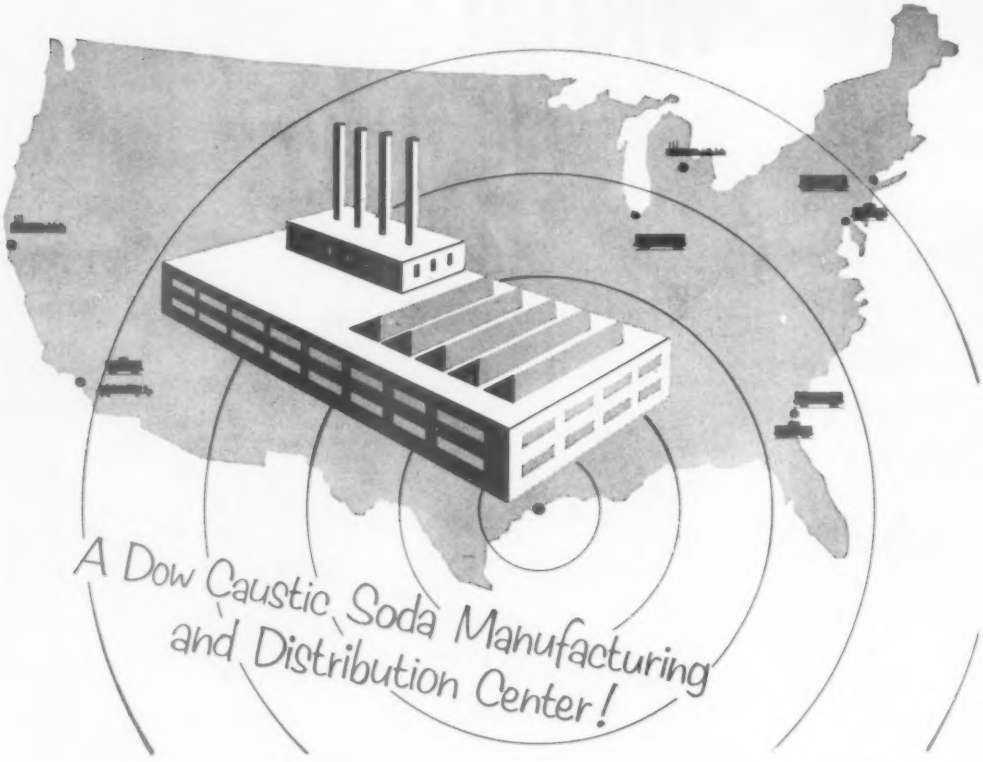
PITTSBURGH COKE & CHEMICAL CO.

Grant Building · Pittsburgh 19, Pa.

WAD 4207

COAL CHEMICALS • AGRICULTURAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

how close are you to Freeport, Texas?



The Petroleum Industry Needs Thousands of Tons of Caustic Soda Each Year!

To keep production steady, the petroleum industry demands prompt delivery of caustic soda. For this reason Dow maintains an outstanding network of distribution facilities. In addition to Dow's caustic soda manufacturing plant and complete distribution center in Freeport, Texas—Dow operates caustic soda plants in Midland, Michigan and Pittsburg, California. Dow caustic soda solution is shipped from bulk tank terminals in Los Angeles, California; Carteret, New Jersey and Charleston, South Carolina. Caustic soda solid, flake and ground flake are shipped from terminals in Port Newark, New Jersey; Chicago, Illinois and Charleston, South Carolina. These points play a large part in providing the petroleum industry with the service it requires.

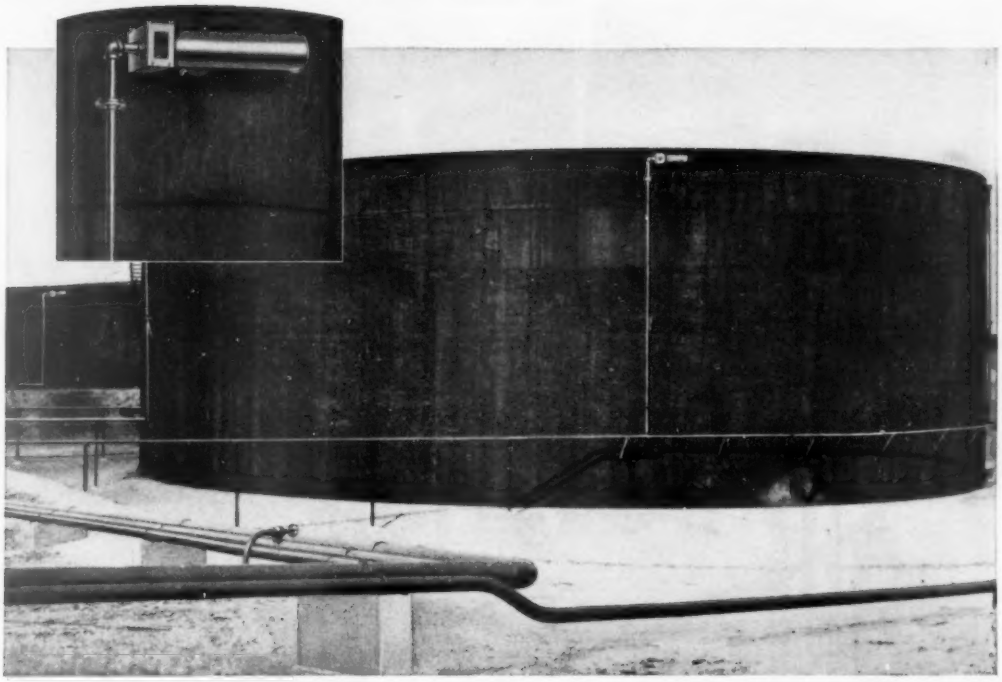
wherever you are... *you're close to*

DOW
CAUSTIC
SODA

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Atlanta • Cleveland • Detroit
Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

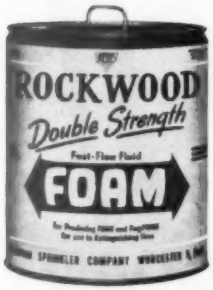
DOW
CHEMICALS
INDISPENSABLE TO INDUSTRY
AND AGRICULTURE



Newest, Fastest Oil-Fire Extinguisher!

Rockwood's Double-Barrelled FOAM Maker Chamber Features Impinging Jet Action . . . Cuts Time And Cost Of Fire-Fighting . . . Is Easy To Install And Inspect

In the new Rockwood Double-Barrelled FOAM Maker Chamber, internal impinging jets discharge into two concentric barrels, one within the other. Providing a longer mixing time in a more compact unit, this patented construction dynamically mixes air, water and FOAM liquid — producing a finer bubble structure and a more heat-resistant FOAM blanket that puts out oil fires faster and more economically. Compactness of chamber design and elimination of supporting brackets enable easy installation from the tank's exterior. Nozzle, vapor seal, and air intake screens are readily inspected from the top of the tank. Rockwood Double-Barrelled FOAM Makers are available in a wide range of sizes to meet existing FOAM standards with maximum efficiency and economy.



Rockwood's new Double Strength Foam puts out fires in flammable liquids faster and at lower cost. Three parts FOAM liquid mixed with 97 parts water form a smothering foam blanket which quickly reseals if broken. Double Strength FOAM liquid is more fluid, faster spreading and flows freely at sub-zero temperatures (−15° F). It's quicker to put into action, covers burning surfaces faster, seals off combustible vapors completely and flows freely around obstructions. This foam blanket has proved its ability to extinguish large spill fires in gasoline with maximum speed and safety to firemen.

Rockwood's Custom Engineered Proportioning Systems are used to proportion the necessary discharge through FOAM nozzles. Spill fires in an oil refinery or fires in oil storage tanks require special proportioning systems. Custom engineered proportioning systems to meet these requirements are a Rockwood specialty.

ROCKWOOD SPRINKLER COMPANY

Engineers Water . . . to Cut Fire Losses

ROCKWOOD SPRINKLER COMPANY
104 HARLOW STREET
WORCESTER 5, MASS.

Please send me more complete information on the new Rockwood Foam Maker and Chamber explaining in detail its operation and application.

Name.....

Title.....

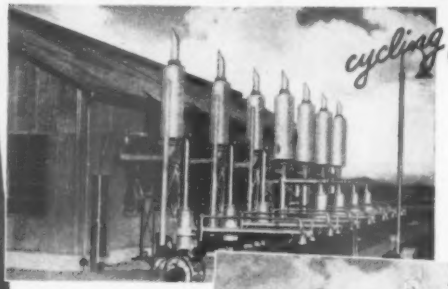
Company.....

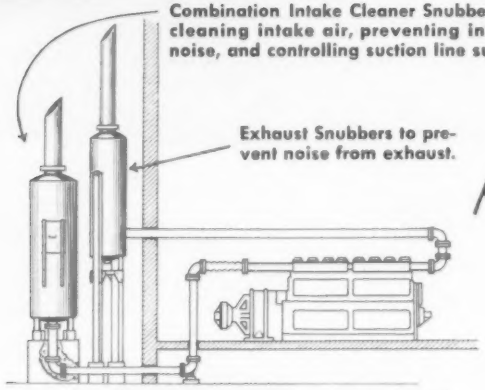
Street.....

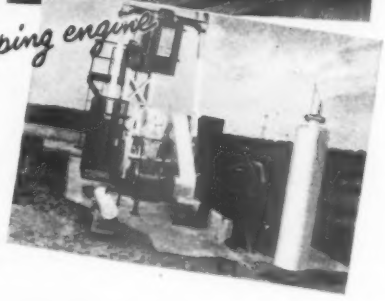
City.....

Zone..... State.....

From the wellhead through the refinery . . . IT'S BURGESS-MANNING




Combination Intake Cleaner Snubber for cleaning intake air, preventing intake noise, and controlling suction line surge.
Exhaust Snubbers to prevent noise from exhaust.



Typical installation showing Diesel engine equipped with Burgess-Manning Intake and Exhaust Snubbers.

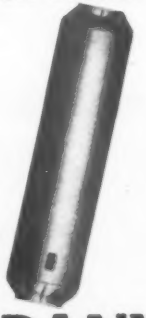
For Quiet Engine Operation

Install BURGESS-MANNING

Combination Air Intake Snubber Cleaners and Exhaust Snubbers

On internal combustion engines everywhere in the petroleum industry, you will find Burgess-Manning Snubbers effectively quieting the thunderous roar of engine exhausts. Likewise, Burgess-Manning Combination Snubber Cleaners on engine intakes reduce the "pumping" noise of intake air without "choking the intake pipe" . . . vibration and air filter fatigue due to pulsing are eliminated. Burgess-Manning is prepared to supply you with Snubbers for any degree of noise reduction your application may require.

For a solution to your engine exhaust and intake noises, consult with Burgess-Manning engineers. For surge control in gas and air lines, write us about our new Gas and Air Line Snubbers.



BURGESS-MANNING COMPANY

Chicago, Illinois — 1203 Dragon Street, DALLAS, TEXAS — Libertyville, Illinois

REPRESENTATIVES: Houston • Tulsa • Los Angeles • St. Louis • New York

THE WILSON

Type "MB" Metal Block PACKER with HOLD-DOWN

For *Hydrafrac Operations, Acidizing, Dual Completions and Gas or Water Injections — the Wilson Type "MB," Metal Block Packer, with Hold-Down is proving to be in a class by itself in giving satisfactory service under most difficult conditions.

The Wilson Type "MB" Packer, with Hold-Down is Full Opening. It will *bold*, regardless of how low the well is swabbed, as it will hold a high differential from underneath, assuring an efficient Acidizing or *Hydrafrac job.

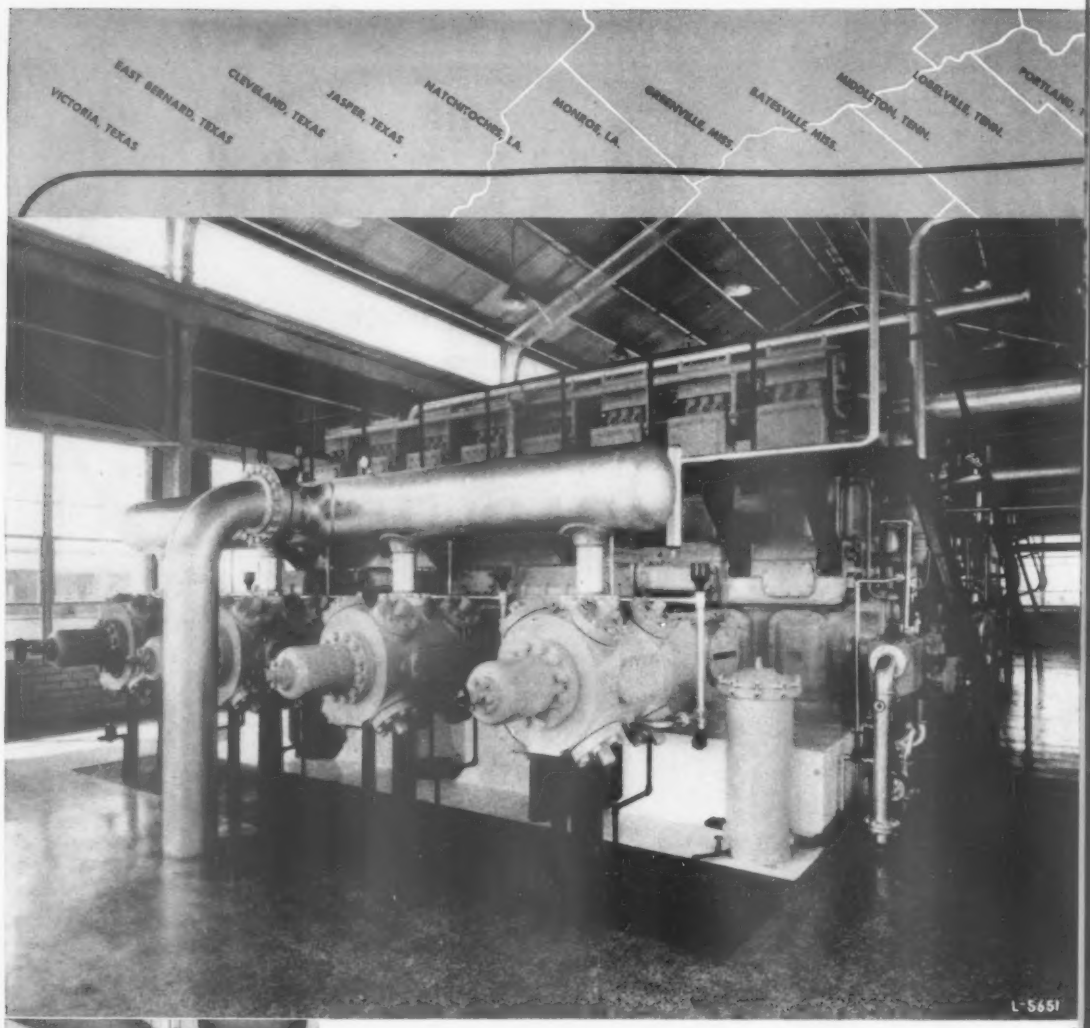
* Copyrighted name.

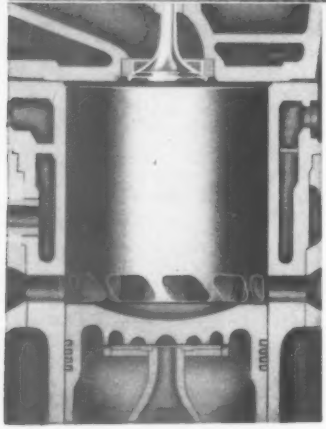
This is an outstanding development in Packer design and construction. It will save you time and money to run the Wilson Type "MB," Metal Block, Packer, with Hold-Down.

SOLD THRU SUPPLY STORES

WILSON FOUNDRY & MACHINE CO.

1417 Elysian St.
HOUSTON, TEXAS

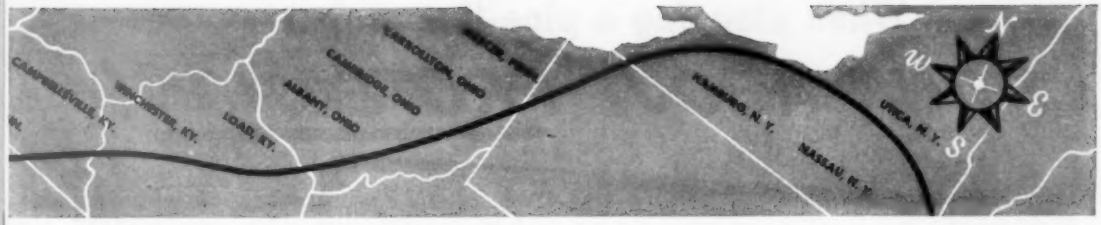




THREE WORTHINGTON 1,600-HP UTC ENGINE COMPRESSORS at Tennessee Gas Transmission Co., East Bernard Station. Installation includes five units now in operation. All engines use Worthington's Unifio through-scavenging system, a design thoroughly proved by years of research by Worthington engineers.

WORTHINGTON'S TIMED-SCAVENGING SYSTEM, in the "vital power center" shown here, is one big reason that Tennessee Gas will get high-efficiency operation and minimum maintenance from their Worthington engines. Features: complete removal of exhaust gas, more thorough charging with gas and air, positive timing for optimum combustion, effective super-charging, and others.

NO OTHER COMPRESSOR WILL



2000-Mile Tennessee Gas Line —Longest in Country— operating 98 Worthington Compressors

46 Worthington UTC Engine Compressors help pump 1,250,000,000 cu ft a day

All along the Tennessee Gas Transmission Company line, from the Gulf Coast to the New England states border, you'll find Worthington UTC gas-engine compressors on the job.

At last report, more than 1,250,000,000 cu ft of gas was being sent through the line daily. A total of 46 Worthington UTC engine compressors are now installed at eight different compressor station locations.

All these UTC units use the Worthington *Uniflo timed-scavenging method*—one big reason for the smooth performance they give. Uniflo scavenging assures a "clean sweep" of burned gases.

While built primarily for pipeline gas compression, the UTC is ideal for many other jobs such as: pressure maintenance on oil wells; varied service in natural gasoline plants; on solvent extraction, vapor recovery, recycling and stabilization of gases in oil refineries; in petro-chemical processing of products made from natural gas under pressure; and in many refrigeration applications.

If your process requires gas compression and you have a suitable gas available for fuel, the Worthington Uniflo UTC can do the best possible job for you.

Sizes range from 1,000 to 2,000 hp. For further information, contact the nearest Worthington District Office or write for Bulletin S-500-B23B.

Worthington Corporation, Engine Division, Buffalo, N. Y.

EK.2.2

OUTPERFORM A WORTHINGTON

WORTHINGTON

Engine Compressors

When planning a pipe-line project—

THINK ABOUT PROTECTION!

Bitumastic Enamel being machine-applied

● When planning a new pipe line, it's wise to include Bitumastic Enamel in your original plans. These coal-tar enamels have established remarkable records for preventing corrosion . . . they have *proved* what they can do. Many oil and gas pipe lines—laid in the nineteen twenties — are still giving good service today, thanks to these durable enamels.

There are many reasons why Bitumastic Enamels are the best barrier against corrosion. Here's an important one: through the years, Bitumastic Enamels keep moisture away from pipe-line surfaces, and that prevents corrosion. *Ordinary* protective coatings just can't keep out moisture year after year.

Specify Bitumastic Enamels for *your* next pipe-line project. It's the sure way to guard against corrosion. For complete details and estimates, get in touch with one of our representatives.

Bitumastic Enamels now available from Koppers new Fontana, California, Plant!

Koppers can now supply Bitumastic Enamels from its new plant at Fontana, California. This plant was built in order to give you better service in the west.

KOPPERS BITUMASTIC ENAMELS

REG. U.S. PAT. OFF.

KOPPERS COMPANY, INC., Tar Products Division, Dept. 1003T, Pittsburgh 19, Pa.

DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH, AND WOODWARD, ALA.

BEST HAND *in the Oil Field*

They're stacked in your favor with DIAMOND's line of chemicals for the oil industry:

Diamond Sodium Bichromate and Chromate as mud additives to protect drill string pipe from costly failures due to corrosion fatigue.

Diamond Flake Caustic Soda, Soda Ash and Bicarbonate of Soda all in daily use as drilling mud control agents.

Diamond Oil-Well Grade Silicate of Soda to protect drill strings in heaving shale sections (licensed under Texaco Development Corporation, available from Dallas only).

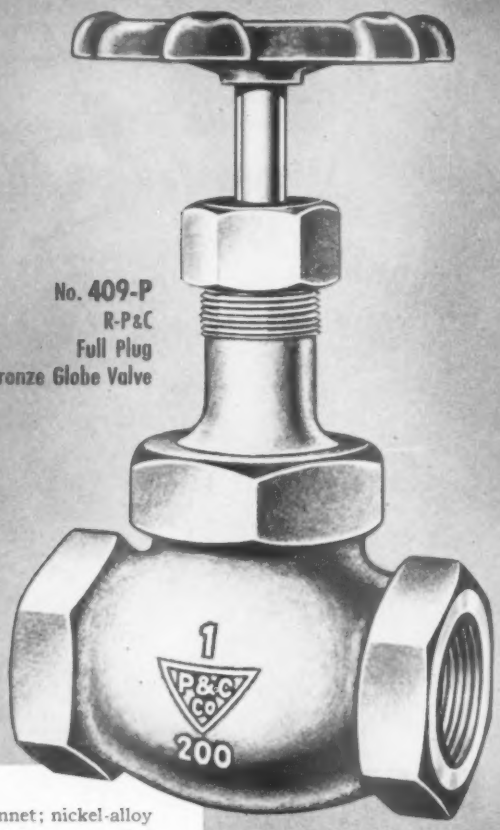
Four DIAMOND plants or warehouse points in the Southwest assure your mud specialist and oil-field distributor of fast service.

DIAMOND CHEMICALS FOR THE OIL INDUSTRY

DIAMOND ALKALI COMPANY . . . CLEVELAND 14, OHIO

DIAMOND ALKALI CHEMICALS ®

an ACCO product



No. 409-P
R-P&C
Full Plug
Bronze Globe Valve

● High test bronze body and bonnet; nickel-alloy disc and seat ring; high tensile, high torque rolled bronze stem—plus large, deep stuffing box easily repacked under pressure—these are the features which make R-P&C Bronze semi-plug and full-plug Globe and Angle Valves outwear ordinary valves. They're fine for frequent or continuous throttling of steam, gas, oil, water. This type valve can be furnished in 200, 300 and 350 lb. pressures.

See your R-P&C distributor for information on the complete line of R-P&C valves or write nearest district office.

R-P&C valves

ACCO

R-P&C VALVE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

Reading, Pa., Atlanta, Baltimore, Boston, Chicago, Denver, Detroit, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

RESERVOIR OF POWER—

recovery is the payoff!

The need for conserving the world's petroleum resources has fostered the close teamwork between research in scientific reservoir engineering and development of efficient production equipment.

Maximum ultimate recovery, by a combination of natural and artificial production methods, has been the payoff—the end result of two decades of teamwork in which National Supply has made major contributions through advanced engineering, manufacturing, and application practices.

The list of National products used in tapping the reservoirs of power is a long one including a complete family of pumping units, wellhead equipment for every requirement, sucker rods for specific well conditions, the efficient gas-impelled plunger lift, and an all-inclusive line of tubular products.

From the very beginning of the petroleum industry National Supply's own research and technological programs have been directed toward the development of completely integrated drilling and production equipment for every possible requirement.

The resulting catalog includes National Supply equipment for every purpose from completion to depletion.

THE NATIONAL SUPPLY COMPANY

Pittsburgh 30, Pennsylvania

Division Offices: Casper • Ft. Worth • Houston • Pittsburgh • Tulsa • Torrance

Canada: The National Supply Company, Ltd., 702 Barron Bldg., 610 Eighth Ave., West, Calgary, Alberta

Export: 600 Fifth Ave., New York 20, N.Y., U.S.A.; River Plate House, 12 South Place, London, E.C. 2

NATIONAL BLUE PRODUCTS

Where effective recovery requires mechanical pumping...

specify **NATIONAL** *pumping units*

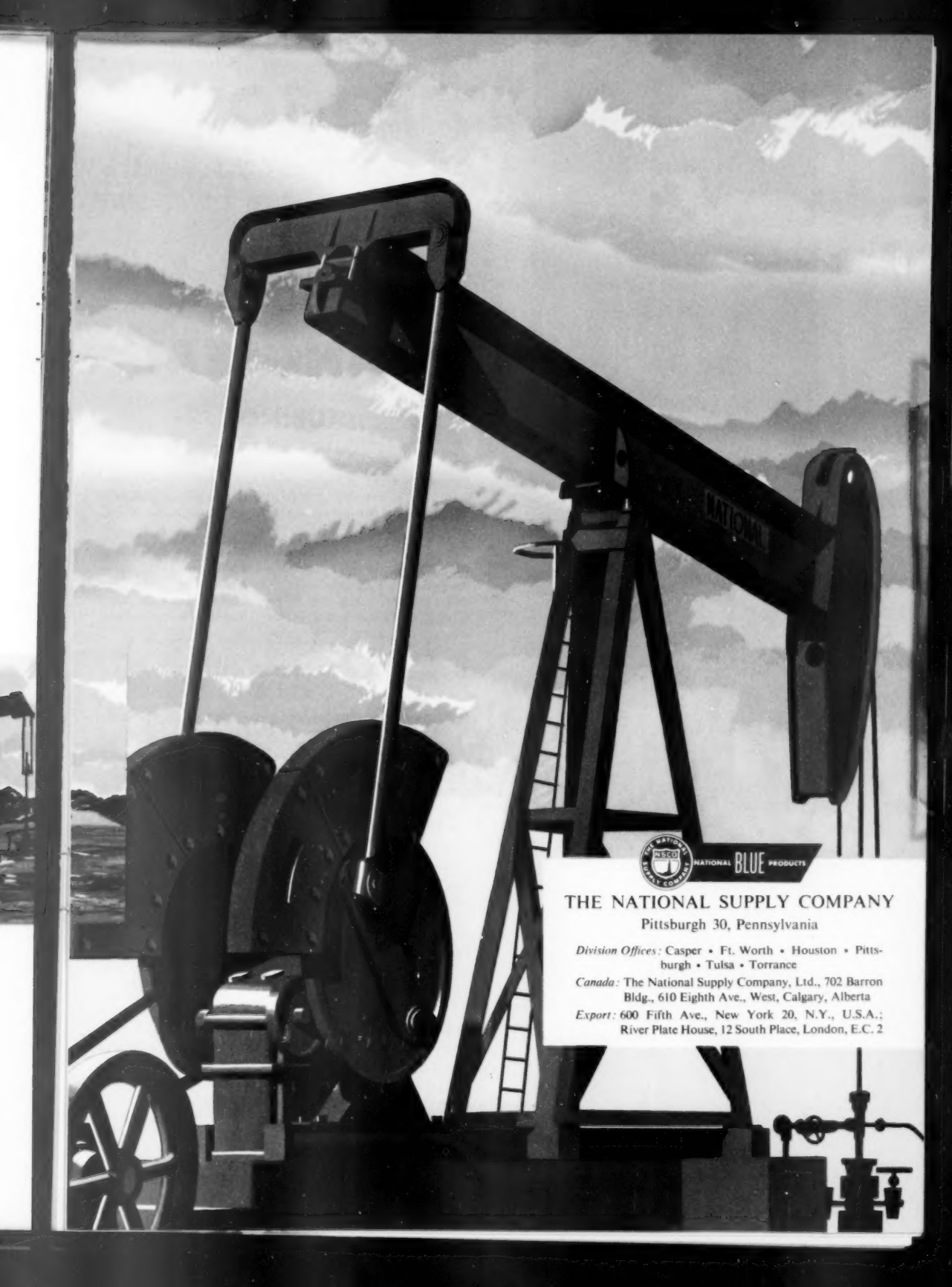
Though the National Supply catalog includes equipment for every requirement from completion to depletion, the demand for rod-type pumping units has resulted in the development of 12 basic sizes of National Pumping Units.

To accommodate these basic units for profitable pumping at any depth there are 60 standard combinations designed to perform under specified load requirements from 3,200 to 32,400 pounds, based on A.P.I. standards for beam loading.

Because these National Pumping Units were designed by engineers acquainted with all phases of rod-pumping, sucker rod applications, and the effects of variable reservoir characteristics, they are certain to perform efficiently with a minimum of attention.

Continuing studies of field performance of National production equipment provides a basis for constant improvement of National Pumping Units, as well as for development of other sizes and combinations to meet new requirements as they arise.

Quite as important as this improvement and expansion of National products for maximum efficient recovery is the fact that you can obtain this equipment readily at National Supply Stores throughout the United States and Canada. Be sure to ask about it.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NATIONAL BLUE PRODUCTS
THE NATIONAL SUPPLY COMPANY
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Division Offices: Casper • Ft. Worth • Houston • Pittsburgh • Tulsa • Torrance
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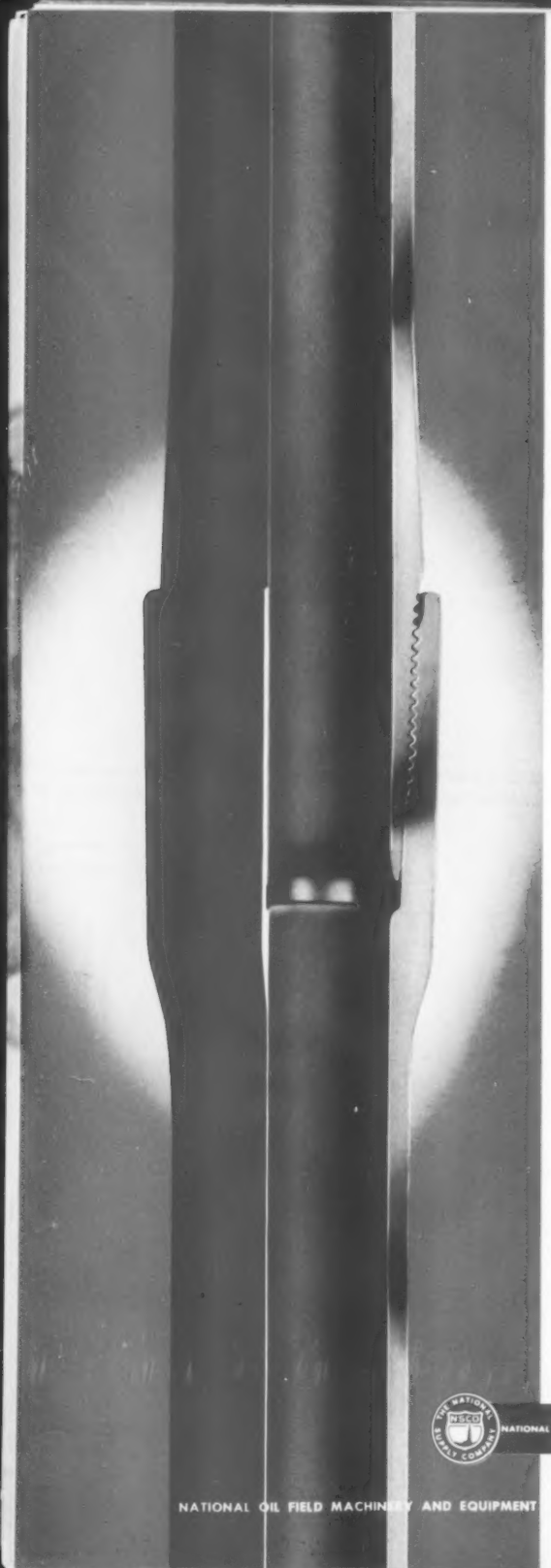


for trouble-free production of high pressure condensate and flowing wells

SPANGSEAL®

TUBING

To complete the production of these reservoirs of power there's Spangseal Tubing, another of the long list of products resulting from National Supply's coordinated research and development.

The records of successful application of Spangseal Tubing have been compiled by operators with long experience in the production of deep wells. The importance of the precision metal-to-metal seal in high-pressure wells has been thoroughly demonstrated in more trouble-free production whether by natural or by artificial lift.

Five major features distinguish Spangseal Tubing from conventional threaded and coupled tubing:

- THE INTEGRAL JOINT, with only two threaded elements
- THE STREAMLINED EXTERIOR CONTOUR which virtually eliminates "hanging-up" while being run
- THE CONICAL SEALING SURFACES, locked in place by joint threads
- THE REDUCED OUTSIDE DIAMETER of the joint which increases hole clearance
- THE ECONOMY resulting from elimination of expensive remedial jobs

The all-round efficiency and leak-resistant qualities of Spangseal Tubing are really worth investigating, either at the nearby National Supply Store or by request for a copy of Bulletin #378.

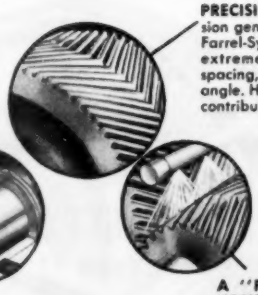
SPANG-CHALFANT DIVISION
THE NATIONAL SUPPLY COMPANY
Pittsburgh 30, Pennsylvania

Division Tubular Offices: Denver, Colorado • Houston, Texas • Fort Worth, Texas • Los Angeles, California • Pittsburgh, Pennsylvania Tulsa, Oklahoma • Calgary, Alberta, Canada

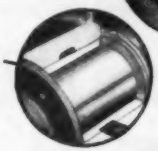
NATIONAL BLUE PRODUCTS

NATIONAL OIL FIELD MACHINERY AND EQUIPMENT • SPANG STEEL PIPE • SUPERIOR & ATLAS ENGINES

"SPOT CHECK"
of features of FARREL® SPEED INCREASERS

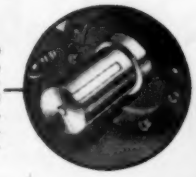


PRECISION GEARS — Precision generation by the famous Farrel-Sykes process results in extreme accuracy of tooth spacing, contour and helix angle. Highest grade materials contribute to long gear life.



OVERSIZE SLEEVE BEARINGS — With consequent low unit pressures. Precision finished to extremely close tolerances.

A "FOUNTAIN OF YOUTH" — The self-contained circulating oil system virtually puts power on "velvet" by providing a protective spray of oil at the mesh line of the gears and pressure lubricating the bearings.

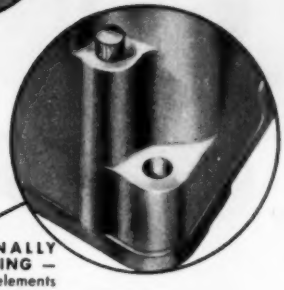


PRECISION-GROUND SHAFTS — Extra large for the power to be transmitted. Give added stiffness against bending and torsional deflections under peak loading conditions.

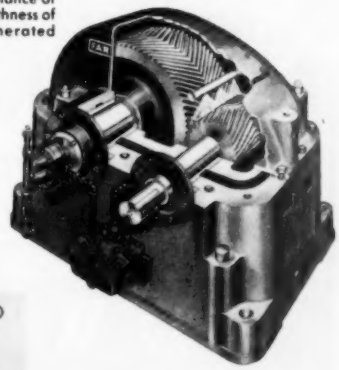
These are the features which account for the amazing record of Farrel speed increasers in pipeline pumping service.

Although hundreds and hundreds of these units have been installed in pumping stations, not one has ever failed on the job. In fact, every unit placed in service since 1932, when the line was first developed, is still operating successfully.

For further details of these proved-on-the-job speed increasers, send for a copy of bulletin 448A. No cost or obligation.



EXCEPTIONALLY RIGID HOUSING — Holds rotating elements in original alignment, insuring maintenance of operating smoothness of precision - generated gearing.



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They Say—

Rusty Pipe to News Ed

Sir:

Ten thousand feet of corroded tubing to your News Editor for his sour blast at "word purists and language theoreticians" who don't like the term petrochemistry (August 11).

Of course they don't like it; it's a verbal monstrosity of the first order. It doesn't mean what it's supposed to mean, any more than petrified means turned into oil, or petrology is a study of petroleum. The fact that petrochemistry has been accepted by the oil industry merely means that a term for "the chemistry of petroleum" was needed. The one obligingly supplied by the Oil and Gas Journal is, unfortunately, illiterate.

Although I am what your editorialist contemptuously refers to as a "professorial" geologist, I was profitably employed last summer by an oil company, and so am only now catching up on my reading of the Big Yellow Magazine. I have gone through a dozen copies in the past few days. My conclusion is that your News Editor should stick to well-worn bugaboos like the tidelands affair and the cartel investigation, and leave word derivations alone. He's out of his depth there.

Robert L. Bates
Columbus, Ohio

Petrochemicals Comment

Sir:

Please accept my congratulations on the splendid job your Journal is doing in covering petrochemical operations along the Gulf Coast.

Frank H. Dotterweich, Director
Division of Engineering,
Texas College of Arts and
Industries, Kingsville, Tex.

Editorial Request

Sir:

I have received a copy of the editorial which was on page 61 of the September 15 issue of The Oil and Gas Journal.

I think the story is excellent and I am wondering if you would give us permission to possibly reproduce it at some future date in the League Bulletin.

William Jackman, president,
Investors League, Inc.,
New York.

Editor's note: Permission granted.

Why Leave It to the Government?

"In 1920 the reserves of iron ore in the Mesabi Range . . . were estimated by the experts at 1.3 billion tons. In the 31 years between then and 1951 some 1.2 billion tons were dug out of the ground and poured into the nation's steel mills.

"A little simple arithmetic would thus seem to indicate the great Mesabi must now be exhausted . . .

"There is only one trouble with all these calculations. They were wrong.

"Somewhat before our memory there was a report of a whaling commission which figured out quite logically the world would soon be bereft of whale oil and therefore in a dire fix. The unknown there was not a sudden discovery of new whales, but human ingenuity which built the petroleum industry. In the case of iron ore, there was a combination of the discovery of new physical resources and great technical improvements in utilizing lower and lower grade ores.

"We are not trying to suggest that we ignore such reports . . . We are suggesting it is dangerous to take inventory and then to act on the premise this inventory is absolute, that all progress has come to an end.

"This, in substance, is what the current Paley Commission, like its predecessors, proposes. We are exhausting our natural resources: ergo, the Gov-

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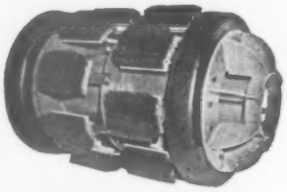

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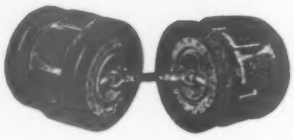

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WC-12 6"-14"
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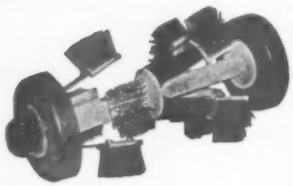

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ernment must move in with a vast control program to save us from ourselves. We must put ourselves in the hands of the expert planners who will plan the use of our resources on the basis of the experts' knowledge of the 'facts.'

"Unlike the Paley Commission, we do not pretend to see the future . . . But the one lesson of the past is that whatever the limits of the Mesabi, the resources of the future are limitless . . ."

Editorial in the Wall Street Journal.

Why Crude Controls?

"There was no need or justification for the imposition of crude-oil price controls. There is even less reason to continue them. Crude petroleum is in ample supply. There is no basis for, or threat of, unreasonable price increases. The domestic oil industry has a responsibility under the defense program to assure adequate oil supplies at all times. The arbitrary and unnecessary control policy of OPS is defeating the accomplishment of this goal."

George H. Bruce, president of Aladdin Petroleum Corp., in a statement issued in Wichita.

Drilling-Mud Symposium

Sir:

Your symposium on drilling muds was the best article of its kind that I have read in several years.

Are there reprints of the complete symposium available?

Walter E. Lewis, chief,
Mineral Industry Survey Branch,
Mining Division, Region V,
U. S. Bureau of Mines,
Minneapolis.

Editor's note: Reprints of this article are not available.

CALENDAR

OCT.

30-31 American Association of Petroleum Geologists, Society of Exploration Geophysicists, and Society of Economic Paleontologists and Mineralogists, annual fall meeting of Pacific sections, Statler Hotel, Los Angeles.

30-Nov. 1 Rocky Mountain Oil and Gas Association, annual meeting, Cosmopolitan Hotel, Denver.

NOV.

3- 4 Society of Automotive Engineers, national diesel engine meeting, Chase Hotel, (tentative), St. Louis, Mo.

5- 7 Industrial Management Society, 16th annual time and motion study and management clinic, Sheraton Hotel, Chicago.

6- 7 Society of Automotive Engineers, national fuels and lubricants meeting, Mayo Hotel, Tulsa.

6- 8 Gulf Coast Association of Geological Societies, annual fall meeting, Hotel Driscoll, Corpus Christi, Tex.

8-13 Oil Industry Information Committee, Conrad Hilton Hotel, Chicago.

10-13 American Petroleum Institute, thirty second annual meeting, Conrad Hilton Hotel and Palmer House, Chicago.

13-14 Society of Exploration Geophysicists, midwestern meeting, Texas Hotel, Fort Worth.

17-18 American Institute of Electrical Engineers, subcommittee on electrically operated recording and controlling instruments, technical conference, Benjamin Franklin Hotel, Philadelphia.

20-21 National Association of Corrosion Engineers, western region, second annual corrosion conference, Biltmore Hotel, Los Angeles.

20-22 Instrument Maintenance Short Course, jointly sponsored by Southern California Meter Association and Los Angeles Harbor Junior College.

21 Natural Gasoline Association of America, district meeting, Herring Hotel Amarillo, Tex.

30-Dec. 5 American Society of Mechanical Engineers, Statler Hotel, New York City.

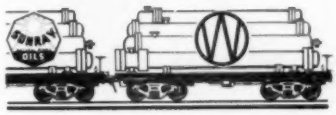
DEC.

1- 3 New Mexico Oil and Gas Association, annual meeting, Albuquerque.

1-6 American Society of Mechanical Engineers, twentieth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York.

4- 6 American Chemical Society, southwest regional meeting, Little Rock, Ark.

5- 6 Interstate Oil Compact Commission, winter meeting, Wichita, Kans.



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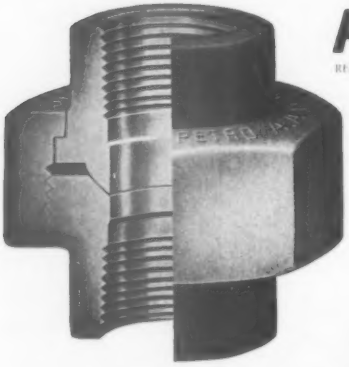

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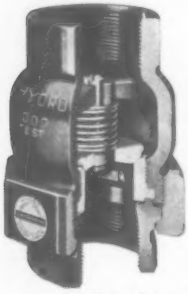

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7-10 American Institute of Chemical Engineers, annual meeting, Hotel Cleveland (Hqs.) and Carter Hotel, Cleveland.

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FEB.

2- 4 Missouri Petroleum Association convention, President Hotel, St. Louis.

15-19 American Institute of Mining and Metallurgical Engineers, annual joint meeting of petroleum, metals, and mining branches, Statler Hotel, Los Angeles.

27 Natural Gasoline Association of America, regional meeting, Scharbauer Hotel, Midland, Tex.

MARCH

2- 6 American Society for Testing Materials, spring meeting, Statler Hotel, Detroit.

4- 6 American Petroleum Institute, division of production, Southwestern district spring meeting, Hilton Hotel, Fort Worth.

8-11 American Institute of Chemical Engineers, Buena Vista Hotel, Biloxi, Miss.

15-17 American Petroleum Institute, division of production, Eastern district spring meeting, William Penn Hotel, Pittsburgh.

16-20 National Association of Corrosion Engineers, ninth annual conference and exhibition, Hotel Sherman, Chicago.

18-20 American Petroleum Institute, division of production, Mid-Continent district meeting Mayo Hotel, Tulsa.

23-25 Western Petroleum Refiners Association, annual meeting, Plaza Hotel, San Antonio, Tex.

23-26 American Association of Petroleum Geologists, Society of Exploration Geophysicists, and Society of Economic Paleontologists, annual meeting, Rice and Shamrock Hotels, Houston.

30-31 Texas Independent Producers and Royalty Owners Association, annual meeting, San Antonio.

30-Apr. 1 Mid-West Gas Association, Broadmoor Hotel, Colorado Springs, Colo.

APR.

8-10 American Petroleum Institute, division of production, Eastern district meeting, William Penn Hotel, Pittsburgh.

15-17 National Petroleum Association, midyear meeting, Cleveland.

21-23 Southwestern Gas Measurement Short Course, University of Oklahoma, Norman.

26-29 American Institute of Chemical Engineers, Chemical Institute of Canada, joint meeting, Royal York Hotel, Toronto, Ont.

27-28 Independent Petroleum Association of America, mid-year meeting, Jefferson Hotel, St. Louis.

Apr. 29-May 1 Natural Gasoline Association of America, annual convention, Rice Hotel, Houston.

MAY

4- 5 American Petroleum Institute, division of marketing, midyear meeting, Baker Hotel, Dallas.

11-13 Southern Gas Association, Jung Hotel, Hotel, New Orleans.

14-23 International Petroleum Exposition, Tulsa.

24-27 American Gas Association, production and chemical conference, Hotel New Yorker, New York City.

28-29 Natural Gas and Petroleum Association of Canada, London, Ont.

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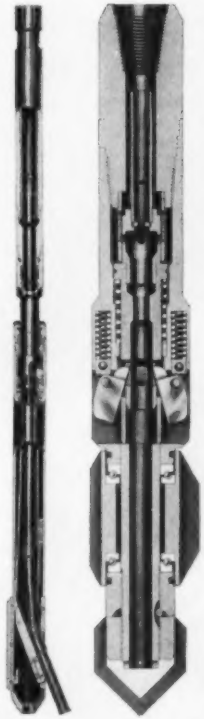

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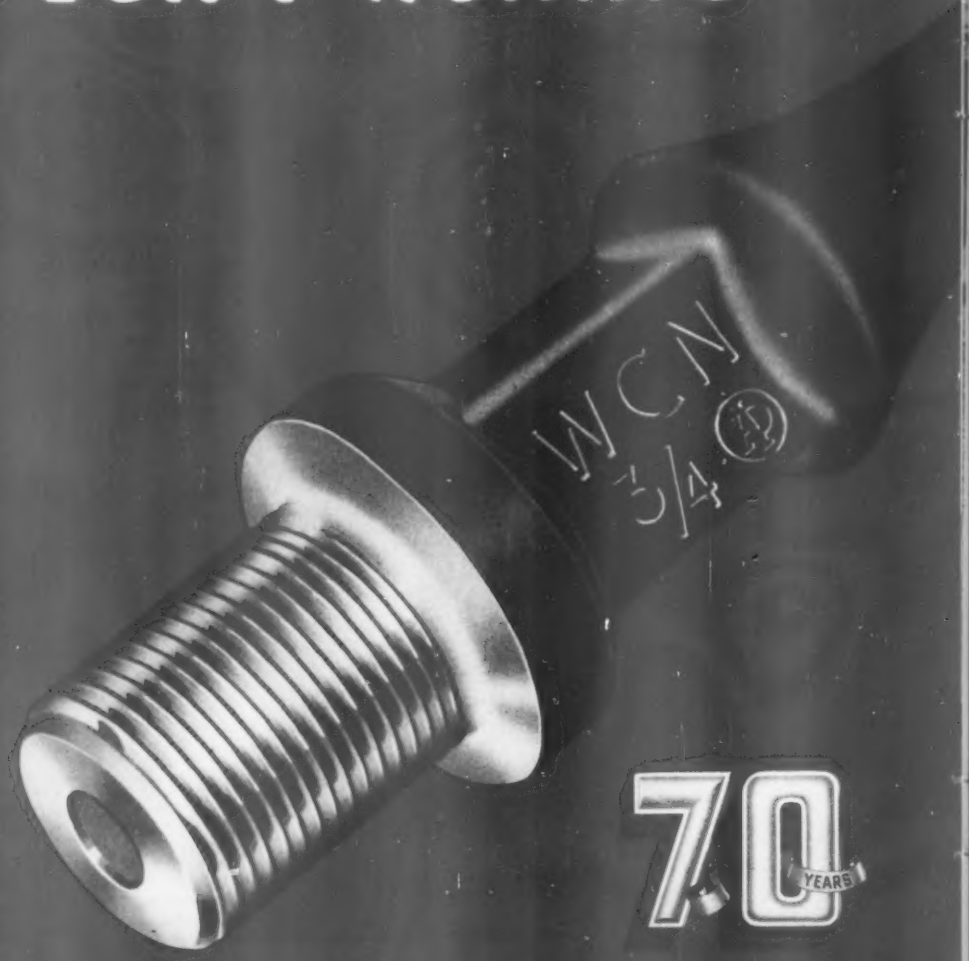

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TULSA, OKLAHOMA

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JOURNALLY Speaking

Gas Plot

THE Federal Power Commission is now in the movies. Well, not exactly in the cast of characters but as a sort of unseen villain of the piece.

The movie was produced by Columbia Gas Systems, Inc., to show the difference between a regulated and a nonregulated business, and it's about two brothers who start Gus' Gas Co. and Dan's Doorknob Co. Being a private enterprise, Dan can try about anything he wants to with his company, but Gus, being a public utility, finds himself restrained by government.

The way the Federal Power Commission is getting its hand into the details of management of the gas industry these days, most gas men think that the FPC is not only playing a leading role in their show but is writing the script and trying to direct the production. (That word "production" is used here as a pun.)

Don't Let 'Em Take it Away

THE Fargo Forum, a newspaper published at the opposite end of the state from North Dakota's new oil fields, already has learned enough about the oil industry to avoid being taken in by political propaganda.

President Truman recently made a whistle-stop campaign speech in the state in which he implied that the Democrats discovered North Dakota's oil and that the Republicans were liable to take it away if elected. He said that the Coast and Geodetic Survey "outlined this structure and this oil field" and "exposed" 2½ billion barrels of oil which will permit the state to produce 200,000 bbl. of oil per day in 2 or 3 years.

This was a bit too thick for the Forum. "We'll forgive the President," it wrote, "for glibly saying North Dakota in 2 or 3 years will be producing 200,000 bbl. of oil a day, for he probably doesn't read the bible of the oil industry, The Oil and Gas Journal, which forecasts a daily production of 200,000 bbl. daily at the end of 10 years for the entire Williston basin, not just North Dakota."

Then it chided the President for giving credit to the Coast and Geodetic Survey, explaining that this agency has nothing to do with geology but locates fixed points and elevations for making surface maps and surveys.

It is true, the newspaper pointed out, that a federal agency, the U. S. Geologic Survey (established in 1879 by a Republican administration), described and named the Williston basin in 1922 (also during a Republican administration), and added:

"However, we're satisfied that history will record Amerada Petroleum Corp. as the discoverer of North Dakota oil, and until oil royalty checks are signed by the Treasurer of the United States North Dakotans are likely to go along with that theory despite Historian Harry."

Now we are wondering if the President will try to tell Texas and Louisiana that the Board on Geographic Names, the Displaced Persons Commission, or some other federal agency gave those states their tidelands and that the Republicans are trying to take them away.

Sixty-cent Gas?

NATURAL gas has shoved coal gas off the map just about everywhere the two have come into competition, but now the nation's chemical engineers are trying to reverse the process.

The idea that a synthetic gas might some day be as good and as cheap as natural gas is not new, but recent experiments with some new German equipment suggest that the day might be coming closer.

A new German catalytic process can synthesize coal gas into methane to make a product almost as good as natural gas at a cost of 60 cents per M.c.f. This is five to ten times the present field price of natural gas, but it's conceivable that the two may come close together sometime.

Only hitch is that most of the cost of this synthetic gas lies in getting the coal to the plant and producing the first raw coal gas for further processing, which means that John L. Lewis still remains the best friend of the natural-gas industry.

—Henry D. Ralph

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Where a lower zone must be protected from contamination by the cement slurry (as well as from sloughings and cavings) the Baker Metal Petal Basket will be found both safe and successful.

The unit is constructed of a number of individual "petals" made of flexible sheet metal. These petals are mounted on reinforcing spring steel ribs, which in turn are mounted on a ring to form a Basket.

When running-in the hole, the upward pressure of the fluid tends to close the "petals" thus providing fluid passageway between the Basket and the walls of the hole, without distortion of the Basket. As soon as the Basket comes to rest, upward pressure by the fluid is relieved and the petals expand to contact the walls of the hole. Any tendency of fluid to move downward then presses the flexible petals more firmly against the entire circumference of the hole. Solids strained from the fluid tend to build a bridge inside the Basket which is thus converted into a one-way, open hole packer of great strength and effectiveness.

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Baker Metal Petal Baskets are "slidably" mounted to permit rotation, spudding, or reciprocation of the casing without distorting or damaging the Basket.

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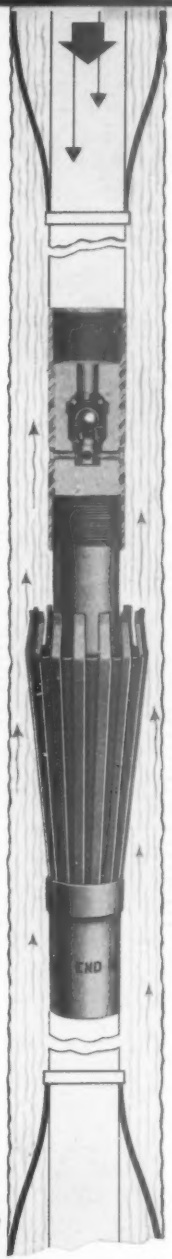

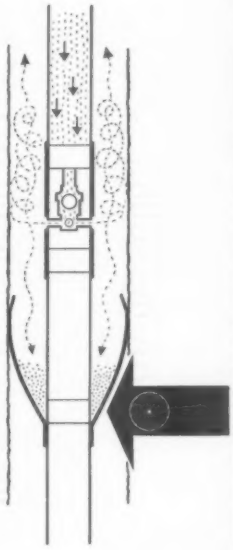

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It's time to stop kicking gas around

THE natural-gas industry has taken just about all the political kicking around it can stand. Unless there is a change in government attitude toward it, people are going to start staying out of the gas business in droves.

As a public utility, transportation and distribution of gas are properly subject to a certain amount of regulation. But regulation now is running hog wild. The reigning philosophy seems to be that anything the gas industry does is wrong and the regulators could do it better.

This results in the regulators, chiefly the Federal Power Commission, taking a hand in the internal operations of transmission companies and substituting their own judgment for that of responsible management. Now the Office of Price Stabilization is getting into the act with an attempt to put a ceiling on the field price of gas, even to the extent of setting aside escalator clauses in old contracts.

THESE actions are ostensibly designed to stave off any possibility of an immediate increase in the delivered price of gas to household consumers, and they have been more or less successful in this objective. But the result has been achieved at the expense of other elements of the industry which, presumably, a regulatory agency should consider. The long-range interests of consumers will suffer from such a short-sighted policy.

Already excessive regulation and the threat of more has discouraged many transmission companies from exploring for gas and building up their own reserves and production. It has caused some independent producers to withhold gas from the market rather than sell it in interstate commerce.

If it is in the public interest for city consumers to have gas, then it is in the public interest to encourage its production and transmission. But gas producers don't always have to sell to pipe lines. Petrochemical and other industries are rapidly moving into producing areas to provide local markets exempt from federal control. Continuation of the present trends could mean less gas for householders regardless of price.

HAVING scared away producers, the FPC policy is now giving investors the jitters. Theoretically, a regulated industry attracts capital through assurance of a steady and protected yield. But regulation which eliminates the prospect for growth and undermines the premise of a fair return is not attractive. Investors can find better places for their money even easier than producers can find better places for their gas.

If the politicians don't stop kicking the gas industry around they are apt to wind up with this: A static transmission industry delivering what's left of its present reserves to its present customers at low rates but acquiring no new reserves, building no new lines, and serving no new customers.

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ANCHOR

PETROLEUM COMPANY TULSA

SALES OFFICES: DES MOINES, OMAHA, TOLEDO, HOUSTON, LOS ANGELES

THIS WEEK

INTERNATIONAL.—Foreign production in August fell to the lowest point since last March, study shows. . . . Russia's Malenkov says Soviet production this year will average 935,000 bbl. daily. . . . Goal for 1955 set at 1,385,000 bbl. daily. . . . ¶Iran formally breaks off relations with Great Britain. . . . British Embassy in Iran hauls down flag. . . . In London Swedish diplomats prepare to represent Iran. . . . ¶First application for new concessions in Peru scheduled to be received by government this week. . . . Several American companies expected to submit applications. . . .

OUTLOOK.—I.P.A.A. committee forecasts 1953 domestic demand of 7,674,000 bbl. daily, gain of 4.9 per cent over this year. . . . Forecast for 1952 revised downward to an average of 7,313,000 bbl. daily. . . . Total exports next year expected to drop to 293,000 bbl. daily and combined export and domestic demand will increase to 7,967,000 bbl. daily, committee says. . . . ¶PAD indicates it will lower its estimates of the amount of drilling needed after next year. . . . Original estimates called for 60,000 wells in 1954 and 65,000 in 1955. . . . Estimates now being reviewed, with indications figures will be lowered substantially. . . .

ON THE WAY TO VANCOUVER Trans Mountain Oil Pipe Line Co.'s 24-in. crude-oil line crosses Deer Creek, west of Jasper, Alta. This is just one of 60 river, stream, and creek crossings required on the 711-mile project, which is scheduled to begin delivering 120,000 bbl. of crude daily to Vancouver beginning next August. Of the 60 crossings, 25 are considered major projects. Pipe for the long line was arriving this month at a rate of 3 miles per day, and a total of 349 miles was expected to be on hand by the end of October.

GOVERNMENT.—Federal regulations restricting oil-industry operations attacked at meeting of I.P.A.A. . . . Crude-oil ceilings described as unnecessary, illegal, discriminatory, and unsound. . . . ¶El Paso Natural's Paul Kayser tells Texas independents the FPC is threatening to halt expansion of natural-gas industry by holding companies' rate of return too low. . . . Increased costs, together with reduced rate of return, he says, means less service to consumers. . . . ¶Texas Railroad Commission fixes November Texas allowable at 3,372,252 bbl. daily, a new record for the third consecutive month. . . . November figure is 103,439 bbl. daily over October allowable. . . .

SECONDARY RECOVERY.—Last of required signatures obtained for Scurry Unit, which would be the world's biggest secondary-recovery project. . . . Area to be unitized includes all of Kelly-Snyder and a part of Diamond M field in Scurry County, Texas. . . . Engineers estimate additional oil recovery from combined water and gas injection to reach as high as 750,000,000 bbl. . . . ¶Pilot flood is approved in three-well pool in California's Wilmington field. . . . Companies contemplate future expansion of project to cover most of field and to involve injection of 250,000 bbl. or more of water daily. . . .

REFINING.—Cities Service reveals plans for multimillion-dollar expansion of its 35,000-bbl. East Chicago, Ind., refinery. . . . Major units will be a 30,000-bbl. crude-topping plant and a 12,000-bbl. catalytic reforming unit. . . . ¶Standard of Texas completes $10,000,000 expansion of El Paso refinery. . . . Crude capacity of plant was increased 7,000 bbl. to a new total of 25,000 bbl. . . . Expansion involved installation of 11,500-bbl. Houdriflow cat cracker, 7,555-bbl. vacuum-flash unit, gas-recovery plant, and 1,400-bbl. alkylation plant. . . .

ACTIVITY.—Production of crude and lease condensate averaged 6,525,800 bbl. daily for week ended October 18, up 13,025 bbl. daily. . . . ¶Total well completions for the week decreased 122 wells to 801. . . . Wildcat completions totaled 187 compared with 255 for previous week and 180 for same week last year. . . . ¶The total of 2,577 rotary rigs operating in United States on October 20 was the highest since July 11. . . .

TRENDS.—Stocks of four major products on October 18 were 15,816,000 bbl. greater than on corresponding date last year. . . . Gasoline inventories are about 5 weeks ahead of last year. . . . Distillate stocks are 12,550,000 bbl. or 11.6 per cent greater than last year. . . . Kerosine is the only major product with smaller inventories than a year ago.

COMPLETED DAM across the Colorado River which will provide water for the huge Scurry water-flood project and nearby cities.

HIGH-AND-DRY pumping jack had to be elevated when dam was closed to prevent being covered with water.

Scurry Unit Set

All required signatures obtained; operators preparing to submit project to Railroad Commission for final approval

DALLAS.—The biggest hurdle to operation of the world's largest water flood was cleared here last week.

Last of the signatures required for unitizing all of Kelly-Snyder and a part of Diamond M field in Scurry County, Texas, was obtained. The unitization program calls for both water and gas injection and is expected by engineers to result in recovery of an additional 750,000,000 bbl. of oil.

R. F. Bryant, Jr., Magnolia Petroleum Co., chairman of the land committee of the Scurry Area Canyon Reef Operators Committee, announced that more than 93 per cent of the working interests and approximately 80 per cent of the royalty interests have signed the unitization documents.

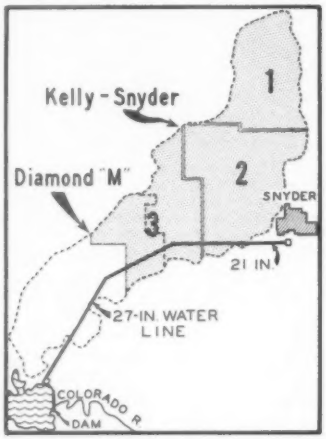
These signatures, he said, represent approximately 90 per cent of the combined ownership of the oil in the prolific reef area to be unitized.

There were these other developments:

... A formal application asking approval of the huge conservation project was being prepared for submission to the Texas Railroad Commission.

... Orders for $2,000,000 worth of equipment needed for the pressure-maintenance program already have been placed, it was announced by W. L. Horner, vice president of Sunray Oil Corp. and chairman of the SACROC engineering committee.

... Additional signatures of holdout interests are expected before plans for the project are submitted formally to the Railroad Commission. Bryant reported to M. Darwin Kirk, of Sunray, chairman of the SACROC executive committee.



Approval of the plan by the Texas Railroad Commission is considered by most operators as a matter of form, since commission members have long advocated adoption of some form of pressure maintenance. At the first meeting of the operators' committee nearly 2 years ago, Commissioner William J. Murray told the group that the commission was eager to assist the operators in promoting conservation in the Scurry County Canyon Reef fields.

The unit will become effective on the first day of the second calendar month after the project has been approved by the commission. The commission is expected to set an early date for the hearing, probably the middle of November.

Why unitization? ... Kelly-Snyder and Diamond M fields were discovered late in 1947 and have now been drilled up.

Since discovery, the bottom-hole pressure has dropped from 3,122 psi. to 1,675 psi., and the gas-oil ratio has increased from 870 cu. ft. of gas per barrel of oil to 1,163 to 1.

At the peak production point in 1950, the proposed unit area had a daily output of nearly 108,600 bbl. Allowables, originally set at 250 bbl. daily, later were cut to 220 bbl. daily and still later to 100 bbl. daily. Current production is about 80,000 bbl. daily.

Engineers estimated that under current production methods total recovery would be about 450,000,000 bbl. or 20 per cent of the oil in place. Under unitized operation, they estimated that ultimate recovery over a 40-year period would total 1,180,000,000 bbl.—about two and a half times the original estimate—and 50 per cent of the estimated oil in place.

Operating plans ... The proposed unit area contains more than 47,000 acres and 1,229 producing wells. It includes all of Kelly-Snyder field and approximately the north one-third of Diamond M (see map).

Under the unitization agreement, the area is divided into three segments, each of which will be operated by a separate company. Standard Oil Co. of Texas will operate Segment 1; Magnolia Petroleum Co., Segment 2; and Pan American Production Co., Segment 3.

A unit manager still is to be selected

to coordinate the programs of the three segment operators. He will be responsible to a central advisory committee named by SACROC and charged with the responsibility of overseeing the entire operation. This committee will include the segment operators and eight other lessees.

Water supply . . . A dependable source of water already has been guaranteed the unit by construction of a dam across the Colorado River at the southern tip of Diamond M field.

This project was undertaken by the Colorado River Municipal Water District, formed by cities of Big Spring, Odessa, and Snyder. Total available supply is estimated at 37,000,000 gal. daily, including 7,000,000 gal. obtainable from existing city supplies and Martin County Well field, which furnishes water to Odessa and Big Spring.

Total water demand of the three cities through 1980 is not expected to exceed 30,200,000 gal. daily. Through 1970, at least, it is estimated that the district will be able to supply 8,000,000 gal. of repressuring water daily to the unit.

Anticipating final approval of the unit operation, SACROC worked out an arrangement for laying the line from the reservoir to Snyder through the unit area. The entire water line incident to delivery of repressuring water is in place and has been tested, and all taps needed for delivering water to repressuring facilities have been installed.

Water already is being impounded by the dam, and limited quantities now are available. It is expected that enough water will be available by January 1 to supply all necessary SACROC water-injection requirements.

SACROC's origin . . . Inauguration of the Scurry unitization project will mark the end of 3 years of study and work toward a program of improved conservation in the area.

Groundwork for the unit was laid originally at a meeting in Midland in February, 1950, of 50 representatives of 30 operating companies. The meeting was called to consider setting up an engineering committee to gather factual data on reservoir behavior to be used in preparing material required by the Texas Railroad Commission at its MER hearings.

It resulted in the formation of the Scurry Area Engineering Committee. As a result of this committee's studies, seven of the major operators in the area agreed in a December 1950 meeting that pressure maintenance was needed and asked that a meeting of all operators be called.

It was at this meeting, on December 20, that SACROC was formed. In January 1951, SACROC's executive and engineering committees were appointed. It was the work of these two groups in developing pressure-maintenance plans, the participation formula, and the unitization agreements that resulted in the completion of all preliminary arrangements for the project.

Expansion Roadblock

TIPRO spokesmen flay unrealistic crude-price controls and FPC rate-of-return policy; full Texas output urged

AUSTIN.—The Federal Power Commission, by reducing the rate of return to natural-gas pipe-line companies, has applied an effective brake on further expansion, according to Paul Kayser, president of El Paso Natural Gas Co.

Taking the commission to task before the Texas Independent Producers and Royalty Owners Association directors meeting here October 20, Kayser stated that if the pipe lines are to be squeezed on the one hand by increased costs and on the other by a reduction in rate of return, the public can only accept a substantial decrease in present service and a checking of future expansion.

The consuming public, he said, wants the service and is willing to pay what is necessary to s e c u r e it. It follows that it is beholden upon the pipe-line companies and producers to carry out a comprehensive, straightforward campaign to inform the consuming public of the problems and measures required to solve those problems.

The fallacy in the commission's claims that the rate-fixing formula is based upon well-known principles and is calculated to allow a sufficient return to yield earnings on stock purchased in the open market has become known to the investing public, he said. Pointing up this situation, Kayser said natural-gas pipe-line companies' common stocks have suffered violent declines since the new rate-making formula was adopted. The consuming public does not yet realize this, he said.

The evidence upon which FPC fixed the presently allowed rate of return is inapplicable to the period in which the rate would be applied, he said. The yields, earnings, and other data for 1946-51 were obtained when the public rightfully or wrongfully understood that:

. . . A 6 per cent return was generally acceptable to the commission (as it was through the entire test period).

. . . The common stock of each company would have the advantage of the leverage between borrowed money and equity.

At the same time the industry went through one of its greatest expansion periods, and the public appraised the stocks based not only on earnings and yields but on growth prospects.

Kayser went on to show that the law of supply and demand has been working as to the price of natural gas in the field. He said the early days when markets were limited and long-distance transmission lines few, an enormous surplus of gas existed which was contracted for at low prices. The companies have been criticized because of the prices in some of the old contracts, he said, but it must be remembered that long-term contracts are necessary to insure a supply of gas to a line, and the surplus gas which was drawn off at the low prices has given to the remaining gas both increased value and a market.

One price . . . El Paso is remedying inequities in its area, he said, by setting, effective the first of this year, one price for principal producing region where El Paso obtains gas. In the Permian basin of West Texas and Southeast New Mexico a 10-cent price has been set for high-pressure, clean pipeline gas with related prices for low pressure and sour gas.

Though such a move is in the public interest, the public must be made to understand that pipe-lines are faced with higher cost of every item that goes into the service. It is up to the producers and companies, he said, to inform the public that FPC's actions will result in a substantial decrease in present service and future expansions.

Storm warnings . . . Directors of TIPRO threw out a warning to defense officials that minimum expansion goals for oil will not be met unless government agencies abolish controls now hamstringing the industry.

The Office of Price Administration was singled out for bitter criticism as the biggest culprit for freezing prices of war-vital oil while freeing prices of materials necessary for producing oil.

Government red tape has been a constant and delaying factor in provid-

ing adjustments in the price of crude to meet the rising cost of exploration, development, and production, TIPRO said.

Directors of the organization also urged that the Texas Railroad Commission "continue the policy of gradually increasing Texas allowables until Texas has regained its full production at maximum rates."

Allowable Up Again

Railroad Commission hikes permissible output of crude in November to 3,372,252 bbl. daily for third straight record

AUSTIN.—The Texas Railroad Commission boosted Texas' crude-production allowable for November to an all-time high of 3,372,252 bbl. daily and established a new record for the third consecutive month.

The continued high output—up 103,439 bbl. daily over last month's allowable—was permitted, according to Chairman Olin Culberson, to offset the possibility of a national heating-oil shortage this winter.

Fear was expressed in some quarters, however, that the 23-day producing pattern for the state generally, plus the 18-day schedule for East Texas would cause aboveground stocks to be built too high. This would hurt worst in West Texas where a transportation bottleneck makes it difficult to dispose of the produced crude. The 23-18 producing pattern is the same as has been followed this month, but greater average daily allowables result since there is one day less in November.

West Texas uneasy . . . Company representatives of Stanolind Oil & Gas Co. and Humble Oil & Refining Co. feared that the West Texas situation could become so acute as to create a "distress oil" condition there. J. A. Neath of Humble agreed with Culberson that the products storage system wasn't alarming at the present, but felt that 23 days would create too much oil in advance of a national demand for heating oil.

Ralph Dietler of Stanolind, said that West Texas is producing more oil than lines can carry. He added that production and storage nationally is too high.

C. M. Bryson, of Crown Central Petroleum Corp., said his refinery is withdrawing crude from storage at a rate of 4,000 bbl. daily and will be forced to reduce operations by mid-November unless it gets more oil.

Commissioner William J. Murray said there was a possibility that stocks may be building up to a too-high level. However, he said, if this is borne out by the mid-November meeting, production could be cut back immediately rather than awaiting the first of the following month as is the usual practice.

The commission's action was in anticipation of a "terrific demand" for heating oil when cold weather really hits, Culberson said. Three years ago a hard winter caused a heavy run on fuel-oil stocks and as a result of some shortages the commission was criticized sharply. It will be possible for the industry to cut back should the stocks become too heavy, but the industry should share the load with the commission, he said.

Bryan W. Payne, Tyler president of Texas Independent Producers and Royalty Owners Association sent a telegram to the commission urging that Texas production be increased gradually to a 30-day pattern at most efficient rates, plus 19 days for East Texas. He maintained that Texas' share of the domestic market should be maintained by increased allowables which would discourage a steady climb of imports. Payne said that U. S. imports for the week ending October 4 total 981,000 bbl. daily, double the rate a year ago.

ALLOWABLES BY DISTRICTS

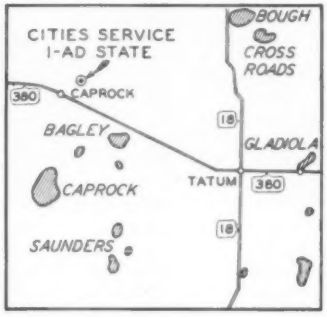
District—	Bbl. daily
1	43,039
2	183,535
3	532,992
4	294,954
5	56,932
6 Outside East Texas	139,082
East Texas field	260,186
7B	140,855
7C	217,564
8	1,145,003
9	260,605
10	97,505
Total	3,372,252

Rank Wildcat Successful

BEAVER, Okla.—Exploration in the Oklahoma Panhandle - southwestern Kansas area is receiving another boost by a rank wildcat gas-distillate discovery well being completed by J. Tom Grimmett and associates. The well is their 1 Hennigh, located in the SW SE NE 11-6n-28eCM, north of Gate, in the northeast corner of Beaver County, Oklahoma.

The well is estimated good for 40,000,000 to 45,000,000 cu. ft. of gas and 200 bbl. of distillate per day, based on preliminary production tests. Production is from the Chester lime (upper Mississippian section, opposite which casing is perforated at 5,792-96 ft., 5,801-33 ft., 5,840-65 ft., and 5,874-5,922 ft. Total depth is 6,415 ft., plugged back to 6,000 ft.

Location is just west of the Harper County, Oklahoma, line and just south of the Clark County, Kansas, line and nearly 10 miles from nearest other production.



Devonian Strike

Flush pool is indicated in test of Lea County wildcat

ROSWELL, N. M.—Southeast New Mexico had prospects of another flush Devonian pool as Cities Service Oil Co. 1-AD State flowed oil at the rate of 2,000 bbl. daily during tests of that formation.

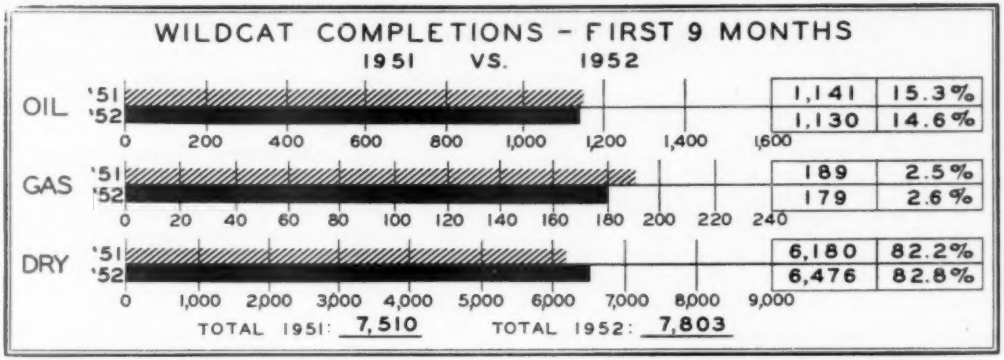
Location of the new producer is SW SE 22-10s-32e, northeast of Caprock and a northeast offset to Jackson, Douglas & Ritchie 1 State, the Wolfcamp discovery and lone producer in Mescalero field.

Cities Service 1-AD State entered the Devonian at 9,808 ft., minus datum point of 5,463 ft., which checked 325 ft. high structurally to the same marker in the Mescalero discovery. That well had gas-cut salt water with no oil shows in the Devonian.

First test of the Devonian in the Cities Service well, from 9,808-35 ft., recovered 6,130 ft. of 44°-gravity oil, with no water. It was drilled ahead to 9,860 ft. With packer at 9,835 ft., a drill-stem test had oil at the surface in 40 minutes. Turned into tanks, it produced 79, 88, 77, and 85 bbl. of oil on hourly gages.

There was practically no gas, but flowing pressure ranged from nearly zero to 2,000 psi., and shut-in pressure registered 3,750 psi. in 30 minutes.

The Devonian is the third pay for the Cities Service well, other pay sections having been indicated by tests in the Wolfcamp and the Pennsylvanian.



Lull in Wildcatting

Effects of steel strike show up in September completion reports; total completions at lowest point in 17 months

John C. McCaslin

WILDCAT completions were off in September, but not so far below this year's trend as development-well completions.

Operators completed 902 wildcats during the month, 44 fewer than August and 80 below September 1951. Total September completions, including both exploratory and development wells, were lower, however, than in any month since April 1951. (See page 183 for details on total completions.)

The steel strike was largely responsible. As supplies of tubular goods shrunk, operators were forced to curtail their drilling programs. Both exploratory and development programs suffered, but most operators continued their exploratory efforts at the expense of development programs. Another factor in the lower completion figure for September was the cancelling or suspending of many drilling projects in the Spraberry Trend.

Success figures . . . Of September's 902 wildcat completions, 108 were oil wells, 28 found gas, and 766 were dry holes. For the first 9 months of 1952, exploratory wells have accounted for 22 per cent of all completions and 25 per cent of all footage drilled.

Completions and footage by states, together with a comparison of figures for the first 9 months of this year and the same period last year may be found in the accompanying tables.

Texas, as usual, led the field with 378 wildcat completions, 11 more than August. Kansas was second with 77, a drop of 11, and California was third with 61.

Permian basin . . . Wildcat completions and new starts held an even tempo in comparison with the previous month.

Gulf 1 McElroy Ranch, wildcat just east of shallow production in McElroy pool, Upton County, discovered oil in the Devonian, making natural flows on four drill-stem tests. At month's end the well had found the Fusselman section of the Silurian high to other exploratory wells in the area and had possibilities of oil from that horizon also.

Attention was centered for some time on Brown and Associates 1 Fasken (started as V. A. Brill), which for a time had prospects of making a multiple-pay discovery. Drilling was stopped in the Pennsylvanian and the hole plugged back for completion as a Wolfcamp discovery. Three sections of that formation gave the well an initial potential of nearly 1,000 bbl. on completion test.

Rocky Mountain . . . In North Dakota Amerada Petroleum Corp. completed its Charlson area wildcat in McKenzie County for the fourth North Dakota oil discovery. The new area lies between Croff and Beaver Lodge fields along the Nesson anticline.

Montana's big news for September was the important Tensleep sand discovery at Nine Mile by George J. Greer in Big Horn County. This rank wildcat is located on the west side of the Powder River basin and on the south side of the Bull Creek syncline.

WILDCAT COMPLETIONS—SEPTEMBER

	Total	Oil	Gas	Dry	Footage
Kansas	77	4	3	70	301,008
Oklahoma	51	4	1	46	240,364
Texas	378	56	10	312	1,878,283
North Central	165	28	1	136	560,577
West	70	11	1	58	430,774
Panhandle	7	0	1	6	40,070
East	19	2	0	17	103,479
Gulf Coast	61	7	3	51	447,261
Southwest	56	8	4	44	296,122
Louisiana	30	6	0	24	253,561
North	17	1	0	16	100,415
South	13	5	0	8	153,146
Mississippi	13	0	0	13	86,649
Rocky Mountain	45	2	1	42	215,889
Dakotas	5	1	0	4	36,121
New Mexico	16	4	0	12	112,478
California	61	2	1	58	301,634
Others	226	29	12	185	549,920
Total September 1952	902	*108	28	766	3,975,907
Total August 1952	946	127	24	795	4,241,935
Total September 1951	982	147	21	814	4,057,043
Cumulative 1952	7,803	1,130	197	6,476	35,047,669
Cumulative 1951	7,510	1,141	189	6,180	31,348,678

*Includes 6 distillate wells: West Texas 1, Texas Gulf Coast 3, South Louisiana 2.

WILDCATS—FIRST 9 MONTHS

	1952		1951	
	Total completions	Cumulative footage (1,000 ft.)	Total completions	Cumulative footage (1,000 ft.)
Kansas	663	2,588	729	2,610
Oklahoma	559	2,604	620	2,565
Texas	3,620	17,422	3,243	15,427
North Central	1,584	5,345	1,371	4,568
West	650	3,829	633	4,027
Panhandle	51	330	21	132
East	197	1,082	197	852
Gulf Coast	528	3,994	488	3,374
Southwest	610	2,842	533	2,474
Louisiana	286	2,521	263	2,065
North	129	757	144	776
South	157	1,764	119	1,289
Mississippi	224	1,012	112	799
Rocky Mountain	344	1,802	235	1,132
Dakotas	29	196	3	18
New Mexico	118	791	67	392
California	444	2,045	405	1,699
Others	1,516	4,067	1,833	4,642
Total	7,803	35,048	7,510	31,349

10 miles east of Hardin. This is the first discovery of oil production this far north in the basin. Closest oil production is in Soap Creek field, 45 miles southwest, where some Madison production is obtained.

In the Cedar Creek area The Texas Co. completed a wildcat 14 miles northwest of the discovery well for 191 bbl. of oil daily.

First commercial production of Mesaverde oil in the Uinta basin was indicated in a Continental Oil Co. wildcat in the Chapita Wells area, Uintah County, Utah. Continental recovered 700 ft. of 60°-gravity oil on drill-stem test. Operators are coring ahead, keeping the well under control with a heavy mud. If completed as a producer the well will become Utah's first 1952 discovery.

Another important Mesaverde development was made at Mountain Fuel Supply Co.'s Trail Unit wildcat in southwestern Wyoming. The wildcat flowed 4,260 M.c.f. of gas daily from the basal Blair sand, lower member of the Mesaverde. This discovery is 20 miles northeast of the Middle Mountain wildcat being drilled by Stanolind Oil & Gas Co. which found Mesaverde oil two months ago and is preparing to complete.

Oklahoma . . . Sinclair Oil & Gas Co. added to the growing list of successful wildcats in Beaver County by completing 1 Maple, a gas-distillate discovery in the Mississippian Chester lime.

Continental Oil Co. found considerable oil in the upper and lower Marchand (Deese) Pennsylvanian sand at its rank Caddo County wildcat, located more than 25 miles north and east of Southwest Carnegie field, nearest production in northeastern Kiowa County. Operators are still drilling at the important discovery, which is contracted to 13,500 ft. in the Springer.

South Louisiana . . . Kerr-McGee Oil Industries, Inc., opened a deep multizone gas and gas-condensate pool at a 20-mile offshore location in Breton Sound, Plaquemines Parish.

Engineers estimated that total gas volume from four separate pay zones would exceed 100,000 M.c.f. daily. The well is shut in and marine drilling equipment has been moved ½ mile northeast for a second test. The big producer is about 60 miles southeast of New Orleans, well within limits of Breton Sound, not in the disputed tidelands territory.

California . . . A second producer was added at the shallow Pliocene sand discovery recently made by Superior Oil Co. at Lost Hills. The new well, a south offset, was Universal Consolidated Oil Co.'s well, which found the sand higher than did the discovery.

Superior's second Lost Hills well was completed in the Pliocene sand. Tide Water Associated Oil Co. and General Petroleum Corp. have stepouts under way and Richfield Oil Corp. has staked an extension test.

Canada . . . California-Standard Oil Co. completed their important Manitoba discovery at Waskada, just north of North Dakota's state line.

In late September four wildcats were either drilling or scheduled to spud in the Waskada area. The area near the discovery is of interest because it has been heavily wildcatted. In an area five townships deep and nine ranges wide, 10 holes already have been abandoned.

Wax Plant on Stream

In the San Roque field, State of Anzoategui, eastern Venezuela, Phillips Petroleum Co. has just completed a plant to manufacture paraffin wax. Crude-oil distillation yields about 15 to 19 volume per cent of wax distillate. This is deoiled by solvent addition and three-stage filtration to make wax. Phillips' investment in the refinery and wax plant amounts to approximately $5,000,000. Adjoining facilities are also in operation for natural-gasoline manufacture and pressure maintenance.

Interference Attacked

I.P.A.A. committees ask removal of crude ceilings, tell members demand will be up, tubular goods will be tight

Henry D. Ralph

OKLAHOMA CITY. — Government regulations which fail to recognize the cost of finding and producing oil and the incentives necessary for increasing reserves were the chief targets of speakers at the annual meeting of the Independent Petroleum Association of America here October 23-24.

These targets were pin-pointed in a series of reports on what to expect in 1953 in regard to: Prices (OPS ceilings should be removed); demand (it will be up 3.3 per cent); tubular goods (planned output is 12 per cent under needs); taxes (there may be another attack on percentage depletion); cost of producing oil (it is up 60 to 80 cents per barrel).

Crude-price report . . . The price ceiling on crude oil maintained by the Office of Price Stabilization drew the most concentrated fire. The report of the price advisory committee presented by George Bruce, president of the Aladdin Petroleum Corp., Wichita, called it "unnecessary, discriminatory, illegal, and unsound."

The price of crude has remained unchanged since 1947 because of a ceiling arbitrarily imposed by OPS without sound reasons and with no legal authority, it said. The attitude of OPS in ignoring the will of Congress and refusing to recognize the problems of oil production is a shameful page in history and if World War III should come it might find the nation with insufficient oil as a result of this policy, the committee declared.

The report recited the history of OPS action and inaction on oil prices and its refusal to act on the many requests for increases filed by the I.P.A.A., Penn Grade, and California producers. It called this a record as bad as the "4 years and 40 hearings" statement of oil prices under the OPA during the war.

The 1952 amendments to the control law expressed the will of Congress to terminate price controls rapidly and to suspend them where conditions of supply permit, but, said the committee, OPS has ignored and flouted this with respect to oil.

Crude-oil costs . . . The cost of finding, developing, and producing crude oil during the first half of this year was 60 to 65 cents per barrel higher than the average costs during the 3-year period 1947-49, it was asserted in the report of the cost study committee, presented by Chairman James V. Brown, who is also secretary of the National Petroleum Council.

Since June 1952 there have been further cost increases which make the spread now between 75 and 80 cents per barrel, the committee estimated.

Since price ceilings on crude petroleum have remained unchanged since December 1947, the committee concluded that "a substantial upward adjustment" is warranted under the OPS formula for calculating price advances.

The increased cost of 60 to 65 cents per barrel of crude produced during the first half of 1952 is an increase of 38 per cent over the average of costs in 1947-49, in contrast to the increase of only 6.6 per cent in the average price of crude petroleum in the same period, the report stated.

After analyzing various elements of cost and applying them to the volume of production during the first half of this year, the committee came out with a set of figures on how much each factor has increased per barrel, as follows: Wages and salaries, 13.70 per cent; other operating and administrative costs, 30.24 per cent; exploratory, 64 per cent; dry holes, 75.8 per cent; intangible drilling of productive wells, 43.26 per cent; equipment of productive wells, 46.66 per cent.

"Giving effect to the cumulative increase in cost of production with allowance for increased volume of production and slightly higher price," the report said, "current net earnings per barrel of net company-interest crude oil produced are estimated to have declined between 50 and 60 cents per barrel below the average net earnings in 1947-49."

However, it was pointed out, this is an average figure, and in cases where production did not rise the increases in net cost per barrel of production and reduction in net earnings were substantially greater.

Production costs are still going up, the report noted. Wages and salaries in the petroleum industry are 7.5 per cent above January 1952 and will rise an additional 4.1 per cent during the third quarter, steel prices are up 6.5 per cent, and the construction-cost index is up 5.24 per cent, so that over-all costs of production are about 5.5 per cent above the first half of this year.

Tubular-goods outlook . . . Current allocations of steel for production of oil-country tubular goods will not be sufficient to permit the oil industry to drill the 55,000 wells established as the 1953 goal by the Petroleum Administration for Defense, the association's committee on materials reported.

The study was made by R. G. Lawton, who until recently was head of the PAD production division and in charge of the allocation program.

There will be a shortage of 300,000 tons of casing, tubing, and drill pipe, or about 12 per cent, which means that the drilling program will fall some 6,000 wells short of the 55,000 mark, the report said, with no provision for making up the 3,000 wells lost from the 1952 program because of the steel strike.

Using the historic factor of 11.3 tons of tubular goods for each 1,000 ft. drilled, the committee calculated that 55,000 wells at an average depth of 4,100 ft. will require 2,550,000 tons, or 635,000 tons per quarter. The allocation for the domestic industry during the first quarter of 1953 has been set at 487,575 tons, or 23 per cent under the requirement.

The committee called on government agencies and the steel industry to increase production of tubular goods, asked for an equitable relationship between pipe exports and domestic allocations, and urged operators to make the most efficient use of available tubular goods.

Taxation report . . . A cheering note was found by the tax study committee in the recent Paley report of the President's Materials Policy Commission.

This committee, headed by Merle Becker, a former president of I.P.A.A., praised the Paley report's support of the present tax treatment of percentage depletion of mineral industries and the need for incentives to increase reserves.

The committee called the report "a thoughtful warning against the folly of those who would tamper with a basic economic element of the oil industry." But it warned that there still may be renewed attacks against percentage depletion unless the industry remains on guard.

It added that some interpretation of the depletion allowance by the Bureau of Internal Revenue are preventing full application of this provision. One of these is the ruling that the depletion allowance shall not exceed 50 per cent of net income, which works a hardship on old properties where production costs are high. Another is the inability of producers to spread the depletion allowance over a period of years to balance loses against profits.

Another complaint registered by the committee was against the practice of

tax authorities of treating independent producers as brokers when they sell newly developed properties to others.

In addition to these five major reports, the association also received reports from its standing committees making these points:

Natural gas . . . The Office of Price Stabilization has denied a request to decontrol field prices of natural gas and is considering imposing a ceiling price of 10 cents per M.c.f. throughout the United States and even applying to escalator clauses in existing contracts.

Stripper wells . . . A survey of fields in the United States where secondary-recovery methods might be applied to increase production would be so valuable to the industry that the I.P.A.A. should finance such a report.

Drilling contractors . . . The standard drilling contract form developed by the American Association of Oilwell Drilling Contractors should be used by all operators. The rising cost of insurance makes it imperative to give more attention to safety on rigs. Contractors and operators should cooperate to improve efficiency as a means of combating rising costs of drilling operations.

Public lands . . . A serious threat to development of oil on the public domain may lie in a current congressional investigation looking to revision and codification of public land laws.

Interstate Oil Compact . . . The Compact Commission has been very helpful in promoting state regulation for prevention of waste in production of oil and gas. I.P.A.A. members have assisted the commission in many ways and should continue to aid it and to attend its meetings.

Gasoline Quality Up

Octane ratings are higher throughout the nation for both regular and premium grades, third-quarter surveys shows

OCTANE numbers of both premium and regular gasoline climbed higher by the end of the third quarter, according to the latest survey of the petroleum chemicals division of E. I. du Pont de Nemours & Co., Inc.

The unweighted average of premium gasoline octane numbers for the 47 cities listed on the current survey and on previous surveys was 90.6, compared with 90.3 at midyear and 89.6 at the end of the third quarter last year.

The average of the octane numbers of regular gasoline for the same 47 cities gained one octane number in the past 12 months with almost half of the increase reported for the third quarter. Only one city had a lower average for regular gasoline than last year.

Use of tetraethyl lead also increased. Average TEL content for premium gasoline was 2.26 cc. per gallon, compared with 1.94 cc. last year. TEL content of regular gasoline was up 0.37 cc. per gallon to an average of 1.96 cc. for the current survey.

Highest octane numbers were reported for cities on the East Coast where the average for premium gasoline from 8 cities was 92.4. Premium averaged 90.6 for the 17 cities in PAW District 2. District 3 had an average of 90.4 for 8 cities, and the West Coast was slightly less with 90.3 for 5 cities. The average for 4 cities in the Rocky Mountain district was 89.3. The 6 Canadian cities included in the current report had an average of 89.0.

GENERAL COMPARISONS*

	Oct. 1951	July 1952	Oct. 1952
Premium:			
Research octane No.	89.6	90.3	90.6
TEL content (cc. per gallon)	1.94	2.22	2.26
Regular:			
Research octane No.	82.9	83.5	83.9
TEL content (cc. per gallon)	1.59	1.85	1.96

*Unweighted averages of 47 cities.

COMPARISON OF MOTOR-GASOLINE SURVEYS

(Octane numbers are by research method; arithmetic averages by cities)

	Premium				Regular			
	Oct. No.			TEL content	Oct. No.			TEL content
	Oct. 1951	July 1952	Oct. 1952	cc./gal. Oct. 1952	Oct. 1951	July 1952	Oct. 1952	cc./gal. Oct. 1952
Aberdeen	88.4	88.9	88.9	2.43	81.4	81.4	82.7	1.74
Amarillo	87.5	88.8	88.3	2.37	80.3	81.1	80.9	2.22
Atlanta	91.3	91.9	92.3	2.11	84.1	84.7	85.2	2.45
Bakersfield	89.3	89.3	89.1	2.81	79.9	81.0	81.2	1.70
Baltimore	92.5	92.7	92.3	2.08	85.6	87.0	87.2	2.17
Boston	91.8	92.4	92.7	2.31	86.0	87.1	87.5	2.15
Calgary	84.5	87.0	87.4	2.58	78.5	81.6	81.4	2.05
Casper	88.2	89.0	89.7	1.71	80.6	81.7	82.2	1.47
Charlotte	91.6	92.0	92.3	2.27	84.6	84.9	85.3	2.40
Chicago	88.8	90.0	90.3	2.12	82.0	82.5	83.2	1.96
Cincinnati	90.8	91.5	91.4	2.57	85.2	86.3	86.1	2.21
Cleveland	90.8	91.6	91.7	2.29	85.2	87.1	87.0	1.84
Columbus	90.7	91.6	91.9	2.26	85.5	86.4	87.1	2.10
Corpus Christi	91.0	90.9	91.3	2.10	83.5	83.2	83.8	2.32
Dallas—Fort Worth	91.3	91.5	91.8	2.27	84.1	82.9	84.4	2.44
Denver	88.2	88.4	89.1	1.83	8.06	80.5	80.7	1.81
Detroit	90.6	91.5	91.8	2.28	84.7	85.9	86.8	2.03
Edmonton, Alberta			88.1	1.84			82.8	1.27
El Paso	85.7	85.5	86.0	2.78	77.2	76.7	76.7	1.93
Great Falls—Billings	90.0	90.3	90.0	2.30	81.3	81.8	82.6	2.15
Houston	91.4	91.7	92.0	2.27	84.4	84.2	84.9	2.52
Indianapolis	89.4	89.8	90.2	2.17	83.0	83.6	83.8	2.04
Jacksonville	91.0	91.3	92.2	2.12	84.9	85.2	86.0	2.21
Kansas City	88.5	89.2	90.1	2.34	82.1	82.1	83.0	1.87
Little Rock	90.5	90.2	91.4	2.13	84.0	83.2	84.1	1.64
Los Angeles	89.9	90.5	90.6	2.34	81.4	82.0	82.3	1.70
Louisville	90.1	91.0	91.3	2.46	83.5	84.9	85.2	2.47
Memphis	90.5	90.9	91.5	2.32	83.3	83.7	85.1	2.16
Milwaukee	89.3	91.1	90.7	2.10	82.4	83.3	83.6	1.92
Minneapolis	89.3	89.3	89.5	2.46	81.9	82.2	82.6	2.06
Montreal, Quebec	89.5	90.4	90.4	1.59	84.7	85.5	85.5	1.35
Nashville	90.0	90.6	91.6	2.38	83.9	84.1	85.2	2.30
New Orleans	90.5	90.6	91.7	2.58	84.0	84.5	84.8	2.23
New York (met. area)	91.7	92.4	92.6	2.28	85.8	86.5	87.0	2.13
Omaha	88.6	89.3	89.5	2.38	81.7	81.9	83.0	1.73
Philadelphia	91.1	92.1	92.3	2.10	86.1	87.0	87.1	2.10
Pittsburgh	91.6	91.7	92.5	2.29	85.8	86.6	86.8	2.12
St. Louis	88.8	89.7	90.2	2.02	82.4	82.8	82.7	2.03
Salt Lake City	88.4	88.6	88.3	1.55	78.2	79.3	80.1	1.05
San Francisco	90.2	90.9	91.1	2.35	81.2	81.9	82.0	1.15
Seattle	89.5	91.0	90.9	2.37	80.8	81.8	82.3	1.79
Shreveport	90.1	90.5	91.0	2.75	83.7	83.9	84.9	2.24
Spokane	89.4	90.4	89.9	2.22	81.2	82.0	81.9	1.90
Toronto, Ontario	89.4	90.0	90.4	1.82	85.1	85.6	85.9	1.45
Tulsa	88.9	89.2	89.8	2.42	82.0	81.5	82.6	2.25
Vancouver, B. C.	88.3	89.0	88.9	2.68	83.2	83.6	83.6	1.82
Wichita	86.8	88.0	89.1	2.43	80.4	81.8	81.8	1.68
Winnipeg	87.8	89.2	88.8	1.88	83.0	84.9	84.7	1.21

Demand Increase Seen

I.P.A.A. predicts domestic demand in 1953 will average 7,674,000 bbl. daily; 1952 forecast is revised downward

OKLAHOMA CITY.—Domestic demand for oil in 1953 will average 7,674,000 bbl. daily for an increase of 4.9 per cent over 1952.

Total exports are expected to decrease 27.3 per cent in 1953 to an average of 293,000 bbl. daily for the year. Combined export and domestic demand will increase 3.3 per cent to 7,967,000 bbl. daily.

These forecasts were made at the meeting of the Independent Petroleum Association of America held here October 23 and 24. They were prepared by the association's economics committee, headed by Harold B. Fell, of Ardmore, Okla.

The committee also revised its forecast of demand for 1952. Current estimates of domestic demand for this year call for an average of 7,313,000 bbl. daily or about 2 per cent less than the projection made last April. Since exports have been larger than indicated by the April forecast, the estimate of total demand for this year had to be reduced only about 1 per cent. The new estimate is 7,716,000 bbl. daily.

For 1953 the greatest relative increase in total demand for the year is forecast for distillate fuels. Total distillate demand is expected to average 1,483,000 bbl. daily, up 5.2 per cent. A gain of 3.8 per cent is forecast for total gasoline demand to raise the 1953 average to 3,355,000 bbl. daily.

Total demand for kerosine is expected to average 378,000 bbl. daily for 1953 or a gain of 2.7 per cent. The rate of demand forecast for residual represents an increase of 1.7 per cent.

The forecast calls for inventory reductions averaging 302,000 bbl. daily for the last quarter of this year and the first quarter of 1953. Additions to storage for the summer months of 1953 are projected at 393,000 bbl. daily to bring total inventories at the end of next September to 698,000,000 bbl. or 17,000,000 bbl. greater than at the end of the third quarter this year. The stock increase for the year 1953 is expected to be 27,000 bbl. daily.

Required supply . . . In order to meet forecast demands and raise inventory levels slightly next year, total required supply must average 7,994,000 bbl. daily or 2.6 per cent more than the 1952 total.

The committee continued its past policy of not breaking total required supply into domestic production and imports, but it did give estimates of the components making up the new supply during September 1952. September supply was shown at 8,045,000 bbl. daily including 6,485,000 bbl. daily of domestic crude, 625,000 bbl. daily of natural gas liquids, and 935,000 bbl. daily of crude and product imports.

The committee called attention to the fact that the total required supply forecast for 1953 is less than actual supply in September. Also, runs to stills for 1953 will be about 180,000 bbl. daily less than the average for the third quarter of this year. Runs for the last quarter of 1952 and the first quarter of 1953 are forecast at 6,904,000 bbl. daily or almost 160,000 bbl. daily less than the third quarter average.

All of the estimates, Fell emphasized, are based on assumptions that industrial production will continue at high levels, no marked change will occur in the international situation, Iranian oil will not be a significant factor in world supply, and weather will be normal.

Details of the forecast are shown in the accompanying table.

UNITED STATES PETROLEUM SUPPLY AND DEMAND FORECAST
(Thousands of barrels daily)

	1952			1953				
Total demand:	3rd Q.	4th Q.	Year	1st Q.	2nd Q.	3rd Q.	4th Q.	Year
Gasoline	3,455	3,210	3,234	3,010	3,480	3,585	3,335	3,355
Kerosine	235	495	368	520	245	240	510	378
Distillate	970	1,705	1,410	2,040	1,095	1,030	1,765	1,483
Residual	1,420	1,720	1,591	1,830	1,485	1,425	1,730	1,618
Other products	1,245	1,120	1,113	1,025	1,130	1,255	1,125	1,133
Total	7,325	8,250	7,716	8,425	7,435	7,535	8,465	7,967
Exports:								
Gasoline	80	70	80	70	70	65	60	66
Kerosine	20	15	21	15	10	10	10	11
Distillate	85	55	77	50	45	45	40	45
Residual	75	60	77	55	60	50	50	54
Other products	75	65	73	65	65	60	55	61
Crude	70	65	75	60	60	55	50	56
Total	405	330	403	315	310	285	265	293
Domestic demand	6,920	7,920	7,313	8,110	7,125	7,250	8,200	7,674
Stock change	+498	−217	+74	−389	+352	+435	−294	+27
Required new supply	7,823	8,033	7,790	8,036	7,787	7,970	8,171	7,994
Closing stocks (million barrels):								
Gasoline	118	133	133	160	143	127	139	139
Kerosine	36	28	28	17	26	37	29	29
Distillate	114	100	100	57	82	120	102	102
Residual	54	49	49	40	46	53	47	47
Other products	94	91	91	92	97	94	92	92
Crude	265	260	260	260	264	267	262	262
Total	681	661	661	626	658	698	671	671
Runs to stills	7,063	6,956	6,681	6,850	6,686	6,895	7,064	6,879

Major-Product Exports Drop

WASHINGTON.—Exports of major oil products dropped to an average of 144,500 bbl. during the week ended September 26 from 224,100 bbl. during the preceding week, according to Petroleum Administration for Defense statistics.

Shipments of aviation gasoline and kerosine increased slightly, but other products showed sharp declines.

Details of the movement for the week, compared with the preceding week, and averages for the 4 weeks ended September 26 are shown in the accompanying table, in thousands of barrels daily.

	Week ended— Sept. 26	Sept. 19	Average 4 weeks
Aviation gasoline	30.0	25.9	37.9
Motor gasoline	5.9	16.2	18.1
Kerosine	29.9	26.1	15.3
Distillate	60.7	109.7	79.2
Residual	18.0	46.2	39.6
Total	144.5	224.1	190.1

New Column Design

Bubble cap and downcomer areas of tray must be placed in proportion to vapor and liquid loadings, A.I.Ch.E. told

F. Lawrence Resen

GALVESTON.—It is necessary in the design of traps in bubble-cap fractionation columns to set areas of bubble caps and downcomers in proportion to vapor and liquid loadings.

Caps should be installed with correct riser ratio if the tray is expected to operate efficiently at full capacity.

These statements were made by G. T. Atkins, of Humble Oil & Refining Co., Baytown, in his discussion of a new design method for bubble-cap trays. Atkins addressed the South Texas section of the American Institute of Chemical Engineers at its annual technical session here October 21.

Selection of these areas has a direct bearing on column pressure drop, since this variable is affected by the flow of liquid and vapor in the column, Atkins said.

Entrainment studies . . . Refinements based on new entrainment studies now are used in equations for calculation of allowable superficial linear velocity and mass velocity in the column. Local velocities for the region just above the caps should be calculated using the area just above the cap region. This area is obtained by deducting the cross-sectional area of the downcomers, and the area of the tray at the edges in which no caps are placed, from the total cross-sectional area of the column.

Surface tension, Atkins said, does not seem to have any effect on entrainment. However, the following factors should be taken into account:

. . . High velocities, from 10 - 100 centipoises and above, cause foaming. Light components dissolved in excessive quantities have the same effect.

. . . High-boiling aromatic fractions have a greater tendency to foam than do straight-run fractions.

. . . Colloidal, suspended matter or a second emulsified liquid phase are objectionable.

. . . Excessive buildup of liquid, due to insufficient liquid-handling capacity, culminates in cycling of liquid to tray above.

. . . Insufficient liquid on tray results in the disappearance of suspended droplets, and the appearance of jets of atomized liquid droplets which are carried to tray above.

Each of these factors must be taken into account, but it is usually possible to adjust operating conditions to eliminate one or more of the objectionable items, Atkins said.

Design aids . . . These rules of thumb were suggested by Atkins for use in tray design:

1. In liquid cross flow, the distance across the tray in direction of flow should be proportional to cap area and inversely proportional to liquid flow.

2. Cap area should be arranged and proportioned in such a way as to permit installation of downcomer along margin, with inlet downcomer on one side and outlet downcomer on the opposite side.

3. Downcomer area allotted for handling liquid should be proportional to liquid flow.

Aid to engineers. . . . Radioisotopes are proving more and more to be valuable chemical-engineering tools.

Applications range all the way from controlling the flow of several products through a pipe line to telling how well products are mixed in large blending tanks.

Jerome Kohl, chief engineer of the western division of Tracerlab, Inc., Berkeley, Calif., told A.I.Ch.E. the above uses are only two of a rapidly growing list.

Others, he said, include using radioactive catalyst beads to determine flow patterns and catalyst-circulation rate in catalytic cracking units and tagging compounds to study flow paths in vacuum towers.

By studying behavior of isotopes in various vessels, Kohl said, engineers can determine many unknown characteristics of compounds plus the particular flow sequence. With this information, they are in a position to improve unit designs.

The one characteristic which makes the radioisotope so valuable as a tracer is the fact that it exhibits substantially the same chemical behavior as stable isotopes of the same compound. Thus it goes through a reaction along with accompanying stable isotopes and can be identified (by such devices as a Geiger-Mueller counter) because of its radioactivity.

Determining flow . . . To determine flow patterns and catalyst-circulation rate in a Houdriflow catalytic cracker, engineers tagged catalyst beads with a zirconium radioisotope. Two sets of Geiger tubes were placed 25-50 ft. apart along a catalyst standpipe. The catalyst beads then were placed in the system and the Geiger tubes determined time required for radioactive pellet to pass between them. The time is fed into a computer along with the density of the catalyst. The result is a plot of tons per hour of circulation.

A most valuable, and probably the oldest, use for radioisotopes is for marking interfaces between various products handled by a pipe line. Here, a radioactive oil in injected in the line when a product change is made. Geiger tubes mounted on the pipe ahead of the receiving station pick up the gamma rays emitted by the isotope and operate a recorder and relay circuit to change valves for the new product or to notify the operator of the coming interface.

Arosorb analyses . . . Estimated plant investment for an Arosorb unit processing 1,555 bbl. daily of 300°-400° F. naphtha is approximately $800,000, and operating costs figure out to an average 1.01 cents per gallon of feed, according to Earl R. Weatherly and H. George Shimp, of Sun Oil Co.

The investment figures were based on erected plant within battery limits. They include both fixed and direct charges.

The fixed charges in the estimate in dollars per day comprised: (1) 10-year depreciation, $219; (2) insurance and taxes (.5 per cent), $11; and (3) maintenance (5 per cent), $110.

Direct charges were: (1) Labor, $120; (2) power, $10; (3) steam, $96; (4) water, $13; (5) desorbent, $25; (6) silica gel (1-year life), $42; and alumina (1-year life), $12.

Total operating cost per day came to $658.

The Arosorb process was developed by Sun primarily to separate by adsorption saturated and aromatic - type hydrocarbons from petroleum fractions boiling at temperatures up to 700° F. *(The Oil and Gas Journal, May 19, page 112).*

An Arosorb unit consists of three sections: (1) Charge-pretreating, (2) adsorption - desorption, and (3) distillation. The adsorption-desorption section is operated in a cyclic manner. The silica fel first adsorbs the aromatics from the feed stock; then a suitable liquid is admitted which recovers these aromatics by desorption. The silica gel thus is conditioned for repetition of the cycle.

Companies Lose Round

Appellate Court denies request to move grand jury probe out of Washington; appeal to Supreme Court is considered

Bertram F. Linz

WASHINGTON.—Barring a Supreme Court order, the grand jury investigation of an alleged international oil cartel initiated by the Department of Justice in September will be made in Washington.

Efforts by five companies to have the grand jury dismissed or the investigation shifted to New York were rebuffed for the second time when the United States Court of Appeals upheld a previous denial by District Court Judge James R. Kirkland.

The appellate court handed down its ruling verbally October 17 and did not file its written opinion until October 21. Company counsel said they would not decide whether to appeal to the Supreme Court until they had studied the opinion, but were expected to submit a petition to the highest tribunal over the week end.

The fight against the grand jury investigation now is back with Judge Kirkland, who has yet to decide, on the basis of argument that was deferred pending the circuit court ruling, motions to quash the subpoenas calling for records as far back as 1928.

To leave them free to take an appeal, the companies last week filed a motion with the appellate court asking it to enter a further order continuing its October 6 order staying any further proceedings in the district court until 5 days after the written opinion is filed.

Alternatively, the companies asked the court to grant a further stay of district court action until final action by the Supreme Court on a petition for certiorari or a writ of mandamus or other appropriate relief and, if such petition is granted, until after the Supreme Court's final decision, provided the companies file their petition within 7 days after the circuit court files its written opinion.

The motion was denied coincidentally with the filing of the court's opinion, but Judge Kirkland was not expected to call for argument on the subpoena motions immediately in order to give the companies time to appeal.

Hand-picked jury . . . Most of the argument on the motion to dismiss or transfer the jury revolved around charges that it was hand-picked.

The companies contended they could not expect a fair decision by a grand jury on which 14 of the 23 members were federal employes, 8 of them from agencies with a direct interest in the case.

The Department of Justice denied the jury was packed or that the investigation was ordered in Washington because, as the companies had charged, the Government could not get indictments in any other jurisdiction where a jury would be composed of non-government members.

The companies also emphasized the burden that would be imposed upon them if they had to produce an estimated 50,000,000 records subpoenaed by the Government and bring a large number of witnesses to Washington. The department argued that "overt acts" in the alleged conspiracy occurred in Washington and it would be more convenient for foreign missions which it said was interested in the case to have the investigation held here. The department also pointed out that the federal records and witnesses on which it would call also are located in Washington.

Barring further action in their effort to kill the investigation, the companies now will center their attack on the subpoenas in an attempt to have them either dismissed or whittled down to a fraction of the period over which the government seeks to fish for evidence to support its charges. The period suggested by the companies is 3 years, covered by the statute of limitations.

Action premature . . . "Matters either within the realm of policy in the Department of Justice or within the ambit of the district court's decretion are not for us in such a proceeding," the appellate court said in refusing to overrule Judge Kirkland.

The general tenor of the court's opinion was that the companies' action was premature.

The court said none of the three points raised by the companies could be considered prior to the bringing of an indictment. These were that: (1) The Government has a direct monetary interest in the proceedings because of its New York suits to recover $67,000,000 in ECA overcharges and that eight of the grand jurors are employed by departments which have a direct interest in oil on the world market; (2) the alleged offenses should be tried in New York to protect the defendants against the "irreparable injury" of the publicity and expense of a criminal proceeding and the transportation to Washington of enormous quantities of material; and (3) if an offense is triable in a state it must be tried there under the Constitution.

"If government employes are not eligible jurors in respect of the subject matter of this proceeding, that fact should be established by evidence presented to the trial court," the court said in dealing with the first point.

"If any court has discretion to discharge this grand jury which is not shown to be ineligible, before any indictment is returned, a question as to which we imply no opinion, it is the district court."

Noting the companies had asked for discharge without prejudice to another proceeding in New York, the court inferred that to mean a discharge with prejudice to further proceedings in the District of Columbia. "So the object of the prayer seems to be, not a government employe ridden jury, but a District of Columbia jury," it commented.

As to the second point, the court said, the federal rules of criminal procedure on which it was based provides for transfer only after indictment or information or bill of particulars. As to the costs emphasized by the companies, it pointed out that much of the documentary material covered by the subpoena is scattered over the world "and the presentation at any one place will obviously be complicated and expensive. The difference between presentation in New York and presentation here is unimpressive."

If it were certain no indictment triable in this jurisdiction could be returned by this grand jury, the trial court might be able to take some action to avoid useless expenditures of time and money, the opinion continued. However, no such showing has been made, and, lacking absolute certainty of invalidity, the control of grand juries lies in the trial court.

As to the third point, the court said, "No one can tell where an offense which may be charged in an indictment not yet returned will be alleged to have been committed" and the Supreme Court has held that if an offense is triable either in the District of Columbia or a state it may be tried in the district.

Scope of subpoena . . . The opinion included some observations on the companies' complaint of the complexity of the proceedings envisioned by subpoenas

WATCHING WASHINGTON

Bertram F. Linz

Prognosticating Flop

Russell B. Brown, general counsel of the Independent Petroleum Association of America, is a studious gentleman who likes to dig into the dim recesses of history and bring back ancient and not so ancient prophecies showing that government experts have never believed that oil, unlike the automobile, is here to stay.

His latest research carried him back to 1866, when a United States revenue commission made a report with a distinctly modern ring—that synthetics would be available if oil production failed. Since then we have produced 45 billion barrels, with another 32.2 billion proven up.

Jumping a few years, Brown discovered that in 1885 the U. S. Geological Survey said there was little or no chance for oil in California (where 9 billion barrels has since been produced), and in 1891 said the same thing about Kansas and Texas where 18 billion barrels has been taken so far).

In 1908 the Survey forecast that production in the future would be only 22.5 billion barrels, and in 1914 the Bureau of Mines took an even more pessimistic view that total future production would be only 5.7 billion barrels.

In 1920 the Survey picked up the ball with a warning that peak domestic production had almost been reached and the United States needed foreign oil and synthetics.

In 1931 the Secretary of the Interior warned we must import as much foreign oil as possible to save the domestic supply. Congress thought otherwise and during the next 8 years, while imports were discouraged, 14 billion barrels was found in this country.

In 1939 the Interior Department was back on the running-out-of-oil theme, saying this country had only a 13-year supply, since which time we have found 15 billion barrels more oil than we have produced.

The State Department got into the act in 1947 with an assertion that sufficient oil cannot be found in the United States. In 1949 Brown found himself back where he started, with a warning by the Secretary of the Interior that the end of the domestic oil supply was almost in sight and we should start producing synthetics immediately.

Maybe if we'd had government control of the oil industry some of these predictions would have come true.

No Funds—No PAD

No provision for operation of the Petroleum Administration for Defense after next June 30 will appear in the fiscal 1954 budget which will go to Congress next January.

The Budget Bureau now is working out the 1954 appropriation estimates but can't do anything for PAD or the other emergency agencies because the Defense Production Act, under which they were established, is due to terminate at the end of the current fiscal year.

A lot of industry men working for PAD would like to go home. Outside PAD there are some who believe it wouldn't hurt to close the agency, which currently has little control activity other than the distribution of materials and the natural-gas restriction order. The Controlled Materials Plan is expected to be revoked next summer, and the situation which led to adoption of the gas order is improving steadily.

But PAD is engaged in other activities which are fully as important as its control functions. It is working on plans to increase alkylate production to meet military needs for aviation gasoline and by making expansion programs running as far ahead as 1955 is keeping the industry abreast of expected increases in demand. PAD officials point out that somebody familiar with the industry must be kept in Washington to handle these and similar matters.

Administration officials also believe that some segments of the present mobilization structure must be retained, even though materials and price controls become unnecessary.

Regardless of what party is in power, it is not expected that the mobilization machinery will be scrapped so long as there is war in Korea, and the chances are good that PAD will be continued for at least another year when Congress gets around to considering the matter.

going back to 1928, pointing out that "an investigation not yet begun involves many considerations not to be found in the progress of an action after complaint or indictment." But, however desirable proper limits upon such investigations may be, they are for adoption by the trial court.

Finally, the court said, "the scope of the subpoenas, which is the first occasion for consideration of limitations upon the proceedings, is not before us. That matter, as we have said, is still before the district court. When it considers the subpoenas it may or may not deem the imposition of some limitations to be in the interest of justice, but that problem is not now before us."

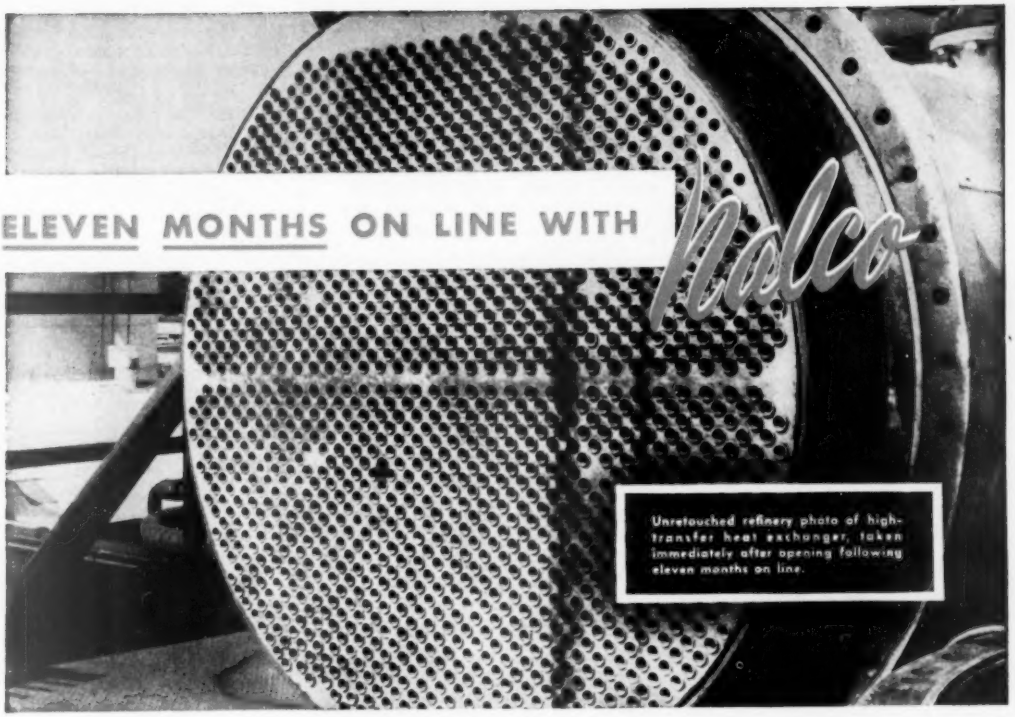
Secondary Stocks Up

Survey shows August gain exceeding 3,300,000 bbl.

WASHINGTON.—Secondary inventories of major petroleum products totaled 56,738,000 bbl. on September 1, an increase of 3,332,000 bbl. during the month of August, according to a

SECONDARY STOCKS
(Thousands of barrels)

	Sept. 1, 1952	Aug. 1, 1952	Sept. 1, 1951
Gasoline:			
Dist. 1	5,853	5,838	5,835
Dist. 2	8,563	8,839	9,451
Dist. 3	2,927	3,150	2,760
Dist. 4	1,023	926	984
Dist. 5	2,141	2,329	1,963
Total	20,507	21,082	20,993
Kerosine:			
Dist. 1	3,431	3,347	3,505
Dist. 2	3,889	3,346	3,963
Dist. 3	793	813	743
Dist. 4	91	92	93
Dist. 5	107	110	116
Total	8,311	7,708	8,420
Distillate:			
Dist. 1	11,403	9,048	9,914
Dist. 2	6,690	5,893	6,430
Dist. 3	1,022	948	749
Dist. 4	469	444	483
Dist. 5	1,221	1,130	1,401
Total	20,805	17,463	18,977
Residual:			
Dist. 1	4,264	4,249	4,224
Dist. 2	1,832	1,707	1,622
Dist. 3	899	1,048	992
Dist. 4	7	13	8
Dist. 5	113	136	159
Total	7,115	7,153	7,005
Major products:			
Dist. 1	24,951	22,482	23,478
Dist. 2	20,974	19,785	21,466
Dist. 3	5,641	5,959	5,244
Dist. 4	1,590	1,475	1,568
Dist. 5	3,582	3,705	3,639
Total	56,738	53,406	55,395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...and clean as the day it started!

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SECONDARY STORAGE CAPACITY, SEPTEMBER 1, 1952
(Thousands of barrels)

	Dist. 1	Dist. 2	Dist. 3	Dist. 4
Gasoline	9,524	18,158	4,912	1,642
Kerosine	5,278	6,441	1,583	183
Distillate	15,125	12,347	1,864	820
Residual	6,178	2,516	1,659	21
Total	36,105	39,462	10,018	2,666

survey by the Census Bureau of the Department of Commerce.

The national total, the bureau said, was 1,343,000 bbl. above inventories on September 1, 1951. Districts 1, 3, and 4 showed increases over last year while Districts 2 and 5 showed decreases.

The report was the second in a series just initiated by the bureau on secondary stocks, to supplement the Bureau of Mines report on primary inventories. Stocks will be reported monthly and figures on storage capacity will be revised quarterly. The September report is the first in which comparative data is given for the previous year.

The report showed a substantial gain during August in distillate stocks on the East Coast where the Petroleum Administration for Defense saw possibilities of shortage this winter.

Stocks and capacities by districts together with revised figures for August 1 and holdings a year ago, are shown in the accompanying tables.

Oil Keeping Up

DPA-certified facilities being completed rapidly

WASHINGTON.—The oil and gas industry is making rapid strides on construction of new facilities for which it has secured certificates of necessity for accelerated amortization.

Up to last June 30, the Defense Production Administration had issued 504 certificates for construction of oil and gas facilities costing $2,276,865,000. It estimates that by September 30 the "value in place" construction (that actually accomplished), had reached $1,187,354,000.

Heaviest expansion . . . The greatest area of expansion is in the refining branch, where 298 certificates had been issued for $1,276,967,000 worth of new facilities. By the end of September, it is estimated, $518,020,000 of this, or 41 per cent, was in place.

Petroleum pipe lines calling for outlay of $571,241,000 were covered by 72 certificates, and construction costing $301,467,000, or 53 per cent, was estimated to have been completed by September 30.

Expansion of natural-gasoline production at a cost of $207,325,000 was covered by 108 certificates — with $146,603,000, or 71 per cent, estimated in place at the close of September.

The best showing was made in expansion of natural-gas-transmission and distribution, where 26 certificates were issued for facilities to cost $221,332,000 of which $221,260,000, or almost 100 per cent, was in place September 30.

Jet-Fuel Stockpile Planned

WASHINGTON. — Possibilities of stockpiling military oil products by the use of underground storage are being explored by the Air Force.

First product to be tested will be jet fuel, about 60,000 gal. of which will be stored in a Kansas salt dome. A contract to provide the storage capacity has been awarded to Don C. Stewart of Wichita, Kans., by the Armed Services Petroleum Purchasing Agency.

The jet-fuel test, if successful, may be extended to other military fuels.

Forecast Study Scheduled

WASHINGTON.—A panel of six consultants will meet with officials of the Petroleum Administration for Defense October 27 to review methods of forecasting crude-oil productive capacity, including the method used by PAD, and discuss probable well completions in the United States through 1957.

The group was appointed last week by Deputy Administrator J. Ed Warren to assist PAD in its continuing investigation of the nation's crude productive capacity.

Members of the panel are Minor S. Jameson, Independent Petroleum Association of America; Stuart Buckley, Humble Oil & Refining Co., Houston; Everett Trostel, DeGolyer & MacNaughton, Dallas; Earl Neal, Standard Oil Co. (N.J.); Edmund C. Babson, Union Oil Co., Los Angeles, and Paul Schultz, Stanolind Oil & Gas Co., Tulsa.

Drilling Goal Cut

PAD lowering estimates of wells needed after 1953

WASHINGTON. — Drilling activity over the next 3 years may be substantially less than originally estimated by the Petroleum Administration for Defense as necessary to the mobilization program.

PAD's present expansion program goes only to the end of 1953 and calls for the drilling of 55,000 wells next year, but it was estimated as late as last June that it would be necessary to drill 60,000 wells in 1954 and 65,000 in 1955.

Most recent estimates indicate that the drilling activity in future years may not be as high as once believed, and PAD now is reviewing its estimates of drilling after 1952 to develop programs through 1955, as requested by the Defense Production Administration. The changed situation was dis-

Strictly Practical, but Pretty

The 'round-the-clock operation of a refinery is all business—and serious business—but this night shot of Gulf Refining Co.'s Toledo refinery shows that several acres of steel structures and shapes can be a thing of beauty, too. At the extreme left is the atmospheric and vacuum crude unit in the 30,000-bbl. refinery. To the right of it is the catalytic polymerization unit, and in the right background is the fluid catalytic cracking unit. The bright spot of light is radiated from the refinery's flare tower.

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closed by Deputy Petroleum Administrator J. Ed Warren in a letter to J. L. Burke, president of Service Pipe Line Co., Tulsa, commenting on a report on line pipe needs through 1955 submitted earlier this month by the Committee for Pipe Line Companies, of which Burke is chairman.

Commending the report, Warren said the formula developed by the committee for determining the relationship of wells drilled to wells that will be connected by pipe line, together with the estimated average crude oil line tonnage and footage needed to connect a new producing well, will be of great value to PAD in determining the requests to be made to DPA for line pipe.

Line-pipe needs . . . However, he pointed out, while the report adequately covers the crude-oil pipe-line requirements for 2 to 10-in. pipe between the producers' lease tanks and the refineries it does not cover the requirements for pipe to connect wells with lease tanks, and that fact will be called to the attention of other interested agencies in order that no misunderstanding may arise.

The report, recommending that pipe mills increase their output of smaller sized line pipe is in line with the thinking in PAD that changes should be made in the pattern of mill production to meet more adequately the needs of the industry under current conditions. At the request of the Interior Department, this matter has been the subject of study by the National Petroleum Council.

Tanker Fleets Growing

WASHINGTON.—A world tanker fleet more than 2½ times as great as at the outbreak of World War II is in the building.

More than 14,000,000 deadweight tons of tank ships are on order or building, according to a survey just made by the National Federation of American Shipping. When this construction is completed, the world tanker fleet will total close to 45,000,000 dwt.

Tanker construction constitutes 64 per cent of the merchant shipping orders on the books of world shipyards.

The federation noted that only 5.3 per cent of new tanker construction is for American-flag operation, while 27.2 per cent is for the United Kingdom and 22.1 per cent for Norway.

The world tanker fleet totaled nearly 30,000,000 dwt. tons in July of this year, nearly 23 per cent of it in the hands of American private operators.

WEST COAST

DEEPER TODAY than they were a year ago are these wells on Pier D in the Long Beach Harbor area. Because of land subsidence, dirt and rock was hauled in to raise the well-head equipment 18 ft. above its former level.

Pilot Flood Approved

Experiment in three-well pool in Wilmington field may ultimately become one of the country's biggest projects

D. H. Stormont

FIRST hurdle in a planned water-injection program for Wilmington field—one which ultimately may involve injection of 250,000 bbl. or more of water daily—was cleared here last week when all parties concerned endorsed the project.

Richfield Oil Corp. and Long Beach Oil Development Co., contractors for the city-owned properties in the harbor area, said they were willing to undertake an experimental flood proposed by the Long Beach Harbor Commission.

Plans for the trial flood now are to be prepared by Harbor Department engineers and submitted to L.B.O.D. for its approval.

Since the contractor's operations will be affected by the program, which is expected to check subsidence and increase ultimate oil recovery, certain terms of the operating agreement will have to be revised. Thus it probably will be several weeks or months before all details are worked out.

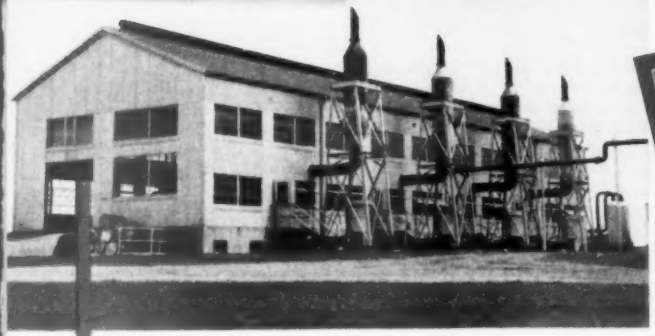
Recommendation that the pilot flood be undertaken was made to the commission by Dr. John Dodge, Los Angeles consultant retained to make the study, in a preliminary report last July. The sub-pool to be tested has only three wells and contains about 1,500 acre-feet of sand. *(The Oil and Gas Journal, July 21, page 43).*

Should the trial flood indicate water injection to be feasible, a full-scale program will be undertaken. This in all probability will involve unitization of the city properties with those of oil companies. Incorporation of city properties with holdings of General Petroleum Corp. and Union Pacific Railroad, which already have combined their holdings and have expressed a desire to do so with the city, would affect 100,000 bbl. of the field's 135,000-bbl. current daily production.

War on subsidence . . . Land-raising operations meanwhile are being continued by the Harbor Department. Dirt and rock are being moved in by barge and truck in a program which already has elevated some portions of the harbor area as much as 18 ft.

The program is expected to extend over the next 2 years and to cost between $25,000,000 and $30,000,000. When completed, effects of all past subsidence will have been erased and, it is hoped, anticipated subsidence for at least another 20 or 25 years. Since 1928 subsidence at the center of the elliptical sinking area has been about 17 ft.

The heavy expense of land-raising operations is due to many factors, in-



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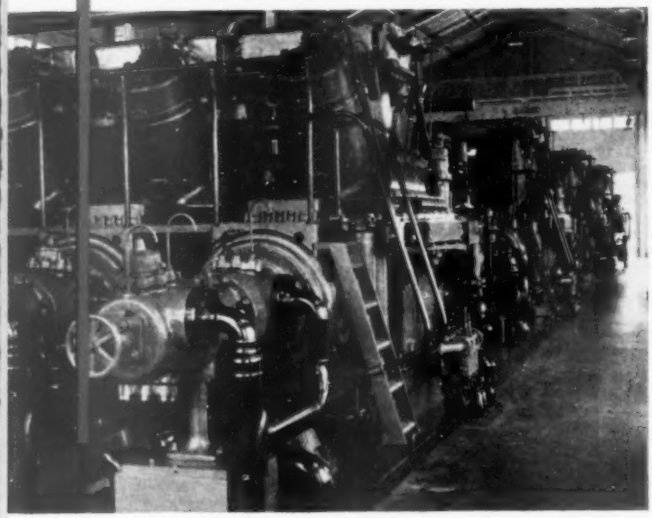

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Seattle, Wash. Shreveport, La. St. Louis, Mo. Los Angeles, Calif.
Caracas, Venezuela Gloucester, Mass. Tulsa, Okla. New Orleans, La.

cluding: necessity for pulling several hundred wells, adding of 18 or 20 ft. of new casing to that in each hole, replacing pumping units after extending the casing, replacing or relocating oil, water, and gas lines, and raising fire walls around central separating and treating batteries.

Engineers are generally agreed that removal of oil, gas, and water is the cause of the surface sinking. Studies have indicated that the quantities of fluids removed from oil zones in the various portions of the field check fairly well with the location and degree of subsidence which has occurred.

California Imports High

SACRAMENTO. — California oil companies are importing foreign crude oil at the rate of approximately 75,000 bbl. daily during October, T. S. Petersen, president of Standard Oil Co. of California, said in an address here.

Speaking on the state's inability to meet the growing demands of the Pacific Coast, he said these imports have been coming by tanker from South America, from the Gulf Coast, from Sumatra and Borneo, and even from Arabia. . . "They have been supplemented by pipe-line shipments from Rangely field in Colorado, and in emergencies even by rail transportation from Utah and West Texas."

While many of the West Coast oil companies are using imported crude to help meet the current demand, he added that they cannot continue to do so under current price ceilings, "because it is just not economic."

MEETINGS

S.E.G. Meeting Set

Twenty technical papers to be presented in Fort Worth

FORT WORTH. — Twenty technical papers will be featured at the sixth annual midwestern meeting of the Society of Exploration Geophysicists at Hotel Texas here November 13-14.

W. Dow Hamm, Atlantic Refining Co., Dallas, will be principal speaker in the opening session, talking on "Geophysical Exploration — Operation Mainbrace" as the topic for his opening address. Also speaking at the opening session will be Fred G. Knight, Ohio Oil Co., Shreveport, president of the Ark-La-Tex Geophysical Society, and Curtis H. Johnson, General Petroleum Corp., Los Angeles, president of the society.

The following technical papers will be presented during the 2-day meeting:

Thursday, November 13

"Exploratory Activity—Permian Basin," H. L. Swords, Union Oil Co. of California, Midland, Tex.; "Unconformities Associated with Oil Accumulation, Denton Pool, Lea County, New Mexico," Ralph H. Fellows, Atlantic Refining Co., Lovington, N. M.; "Wavelet Contraction, Wavelet Expansion, and the Control and Seismic Resolution," Norman Ricker, Carter Oil Co., Tulsa;

"Geophysical Reconnaissance of the Middle Amazon River Valley," Neil W. Mann and K. E. Burg, Geophysical Service, Inc., Dallas; "Gravity Measurements and Their Interpretation in South America Between the Latitudes of 15° and 33° South," Paul C. Wuenschel; "Oil and Gas Exploration in Alabama, Georgia, and Florida," Robert B. Baum, Seismograph Service Corp., Shreveport;

"Wavefront Charts and Raypath Plotter," Albert W. Musgrave, Magnolia Petroleum Co., Dallas; "Safety is Your Responsibility," Bart W. Sorge, United Geophysical Co., Pasadena, Calif.; "Accident Costs Can Be Reduced Through Industry Cooperation," J. Doyle Settle, American Association of Oilwell Drilling Contractors, Dallas; "Essentials of a Safety Program for Geophysical Contracting Companies," W. H. Newton, General Geophysical Co., Houston; "A Demonstration of Some Serious Hazards That are Peculiar to Geophysical Operations and Some Suggested Ways to Eliminate These Hazards," G. M. Kintz, U. S. Bureau of Mines, Dallas.

Friday, November 14

"Interpretation Method for Well Velocity Surveys," Dean Walling and Carl H. Savit, Western Geophysical Co., Los Angeles; "Core Hole Velocity Surveys," Richard Brewer and J. B. H. Henderson, Atlantic Refining Co., Shreveport, and Survey Drilling Co., Dallas; "A Review of Exploration and Development in the Uinta Basin, Utah," Verne E. Farmer, Jr., Carter Oil Co., Vernal, Utah; "Exploration History (Prior to the Cotton Valley Discovery) of the Ruston field, Lincoln Parish, Louisiana," J. Ryan Walker, Arkansas Natural Gas Corp., Shreveport;

"Problem Areas for the Seismologist," Glenn M. Conklin, Sun Oil Co., Dallas; "Gravity Case History; Dawn No. 156, Ontario," Richard A. Pohly, Seismograph Service Corp., Tulsa; "Evaluation of Anomalies by Derivatives," H. Wayne Hoylman, Hoylman-Morris, consultants, Los Angeles; "Seismic Recording on Magnetic Tape," G. B. Loper and R. R. Pittman, Magnolia Petroleum Co., Dallas; "Geophysical Models," Robert Davenport, Texas Seismograph Co., Wichita Falls, Tex.

Corrosion Papers Scheduled

LOS ANGELES. — Five technical papers of particular interest to the petroleum industry will be presented at the second annual corrosion conference to be held November 20 and 21 by the western region of the National Association of Corrosion Engineers at the Biltmore Hotel.

The papers and their authors are: "Conquest of Oil Well Corrosion," E. N. Frisius; "Refinery Corrosion Problems," E. H. Tandy; "Recent Developments in European Corrosion Research," Dr. Pierre Van Rysselberghe; "Plastic Coatings for Corrosion Problems," C. G. Munger, and "Current Applied Research in Cathodic Protection," H. A. Humble.

Geologists to Meet

Technical program planned for Gulf Coast association

CORPUS CHRISTI. — An extensive technical program is planned for the second annual meeting of the Gulf Coast Association of Geological Societies at Hotel Robert Driscoll here November 6-8.

"The Use of the Micro-Contact Log in Southwest Texas," Ralph W. Garrett, Jr., Humble Oil & Refining Co.; "Origin of the Sandsheet in Southwest Texas," Dr. Alan Lohse, Shell Oil Co.; "Entrapment of Petroleum Under Hydrodynamic Conditions," M. King Hubbert, Shell Oil Co.; "The Mustang Island Field, Nueces County, Texas," Travis E. Hicks, Renwar Oil Corp.

"Petroleum Geology of the Smackover Formation of Southern Arkansas," Jack H. Vestal, Murphy Corp.; "The Fairview Field, Concordia Parish, Louisiana," Robert J. Moffatt, Carter Oil Co.; "Electric Log Study of the Pettet Limestone in the Ark-La-Tex Area," B. J. Peck and R. H. Ogden, Arkansas Fuel Oil Co.; "Geology of the Danbury Salt Dome, Brazoria County, Texas," P. F. Sollars and John E. Walters, Humble Oil & Refining Co.

"Gas and Oil Possibilities of the Southeastern Gulf Coastal Plains," P. H. O'Bannon and Morgan J. Davis, Humble Oil & Refining Co.; "West Cote Blanche Bay Dome," R. E. Hackbarth and James A. Seglund, The Texas Co.; "Delta Farms Field," Lee Morgan, The California Co.; "Application of MicroLog to Determination of Porosities," H. G. Doll, Schlumberger Well Surveying Corp.; "Avondale Field, Jefferson Parish, Louisiana," Eugene Gibson, Humble Oil & Refining Co.

"An introduction to the Operational Application of Limestone Thin Sections," R. E. Chancellor, Shell Oil Co.; "Geology of Mineola Basin of Wood and Smith Counties, Texas," R. W. Eaton, P. G. Lake, Inc.; "South Louisiana Fault Trends," William Wallace, Forest Oil Corp.; "Jefferson Island," Jay Wharton, Bates & Cornell; "Phoenix Lake Field," Richard Wilson, Ohio Oil Co.; "The Geology of Down Dip Pinchout in the Mustang Island Trend," James K. Rogers, Arkansas Fuel Oil Co.; and "The Geology of the

R.M.O.G.A. Keynoter Named

DENVER.—Keynote speaker for the annual meeting of the Rocky Mountain Oil and Gas Association meeting here October 30-November 1 will be B. Brewster Jennings, president of Socony-Vacuum Oil Co., Inc., New York.

Other speakers include Price Daniel, Texas attorney-general; Russell B. Brown, general counsel of the Independent Petroleum Association of America, Washington; and Boyd Guthrie, U. S. Bureau of Mines, Rifle, Colo.

Foreign Output Drops

Sharp cut in Venezuela responsible, but increased United States production results in a net world gain for August

Dahl M. Duff

TOTAL crude-oil production outside the United States showed another substantial decline in August to fall to its lowest level since last March.

Total foreign output, exclusive of Russia and its Communist satellites, averaged 4,923,200 bbl. daily, down more than 95,000 bbl. daily from the previous month.

It was the second month in which foreign production has dropped sharply. The declines occurred in several of the world's major oil-producing areas, particularly Venezuela and Kuwait.

A gain in crude production, however, was shown in the United States in August. Domestic production was up to 6,270,000 bbl. daily, an increase of about 177,000 bbl. daily, or nearly 3 per cent over the previous month.

This increase in the United States more than offset the foreign decrease, and as a result total non-Communist world production for the month rose by some 82,400 bbl. daily to 11,193,200 bbl. daily. When compared with August 1951, the 12 months' non-Communist world gain represents an increase of slightly under 5 per cent.

If the estimated production of Russia and other Communist countries is included, the total of world production in August amounts to an average of 12,308,300 bbl. daily. Output of the Communist fields is now considered to be approximately 1,115,000 bbl. daily.

Crude production figures so far this year support the belief of industry economists that the rate of gain in demand in 1952, foreign as well as in the United States, will be considerably below that experienced the last 2 years. The slump in the heavy-fuel-oil market has caused cutbacks in Venezuela, and reports from Europe indicate a slackening in demand in several important consuming areas.

Venezuela down . . . The decline in production in Venezuela in August was the most severe to occur since May 1950, when the monthly production fell by about 200,000 bbl. daily as a result of a strike of oil workers. The drop in August was due to market conditions and amounted to 78,300 bbl. daily, or 4.3 per cent.

Venezuela's total production in August of 1,724,800 bbl. daily was the lowest since August 1951. The country's output rose to a peak last May of 1,844,400 bbl. daily, and at that time it was believed the 2,000,000-bbl. daily mark might be reached by the end of the year.

Oil-company officials in Caracas, however, said production is expected to turn upward again the remainder of the year. They pointed out the decline was a seasonal influence made more severe by the steel strike in the United States which cut into consumption of heavy fuel oil.

Production by weeks in Venezuela in August was: week ended August 4, 1,739,300 bbl. daily; August 11, 1,719,600 bbl. daily; August 18, 1,752,000 bbl. daily; August 25, 1,701,200 bbl. daily; and September 1, 1,714,100 bbl. daily. Production by individual operators was:

Company—	August	July
Creole	744,471	782,552
Shell	535,132	567,462
Mene Grande	269,310	274,350
Socony-Vacuum	57,808	59,151
Mercedes	24,892	25,626
Texas	19,605	21,149
Richmond	24,339	23,425
Atlantic	16,089	17,071
Sinclair	13,462	11,723
Phillips	9,674	9,807
Pantepec	9,090	9,897
B.C.O.	946	941

Other areas . . . Elsewhere in the Western Hemisphere, crude production in Canada was at another record. Output of the fields in the prairie provinces has been mounting steadily since February but will drop back later during the winter when pipe-line movements are decreased.

Production in Colombia was relatively

WORLD CRUDE-OIL PRODUCTION
(In thousands of barrels daily)

Country—	Aug. 1952	July 1952	Aug. 1951
W. Hemisphere:			
Argentina	68.0	68.0	69.4
Bolivia	1.5	1.5	1.0
Brazil	2.0	2.0	2.4
Canada	192.8	188.5	170.5
Chile	2.5	2.4	1.9
Colombia	109.0	109.5	106.8
Cuba	0.1	0.1	0.1
Ecuador	7.9	7.9	7.5
Mexico	213.7	207.1	203.2
Peru	45.5	45.5	46.4
Trinidad	59.0	59.0	57.0
Venezuela	1,724.8	1,893.1	1,739.9
Total	2,426.8	2,494.6	2,375.2
Europe & Africa:			
France	7.5	7.4	6.3
Fr. Morocco	2.9	2.9	1.6
W. Germany	34.9	34.8	27.4
Italy	1.0	1.0	0.4
Netherlands	13.9	14.1	13.6
Egypt	45.0	45.0	43.0
United Kingdom	1.1	1.1	0.9
Total	105.3	105.3	93.2
Middle East:			
Bahrein	30.1	30.0	30.1
Iran	30.0	30.0	9.3
Iraq	440.0	337.0	176.6
Kuwait	710.6	810.2	686.6
Qatar	68.9	68.1	48.2
Saudi Arabia	816.6	850.5	837.8
Turkey	0.5	0.3	0.2
Total	2,096.7	2,126.1	1,788.8
Other Asia:			
British Borneo	105.0	105.0	2.0
Burma	2.4	2.4	2.2
India	6.0	6.0	5.0
Indonesia	165.0	163.0	153.0
Japan	6.4	6.2	6.4
New Guinea	4.7	4.8	4.9
Pakistan	3.9	3.9	3.3
Total	293.4	291.3	176.8
Total foreign less Russia*	4,923.2	5,018.3	4,434.0
United States	6,270.0	6,092.5	6,232.3
Total non-Communist areas	11,193.2	11,110.8	10,666.3
Est. Russia:†			
Austria	45.0	45.0	42.0
Romania	85.0	85.0	85.0
Russia	960.0	960.0	850.0
Other Communist areas	25.1	25.1	22.1
Total	1,115.1	1,115.1	999.1
World total	12,308.3	12,225.9	11,665.4

*Less other Communist-controlled areas.
†Incl. other Communist areas.

Figures are from reliable reports in the industry or official government sources. Data for Russia and Eastern Europe are based on competent estimates; no authentic information is available on month-to-month production in these areas. Completely current reports also are lacking for certain countries of Southeast Asia. Data for earlier months have been revised where necessary.

Other Communist areas comprise Albania, China, Czechoslovakia, Hungary, Poland, and Yugoslavia.

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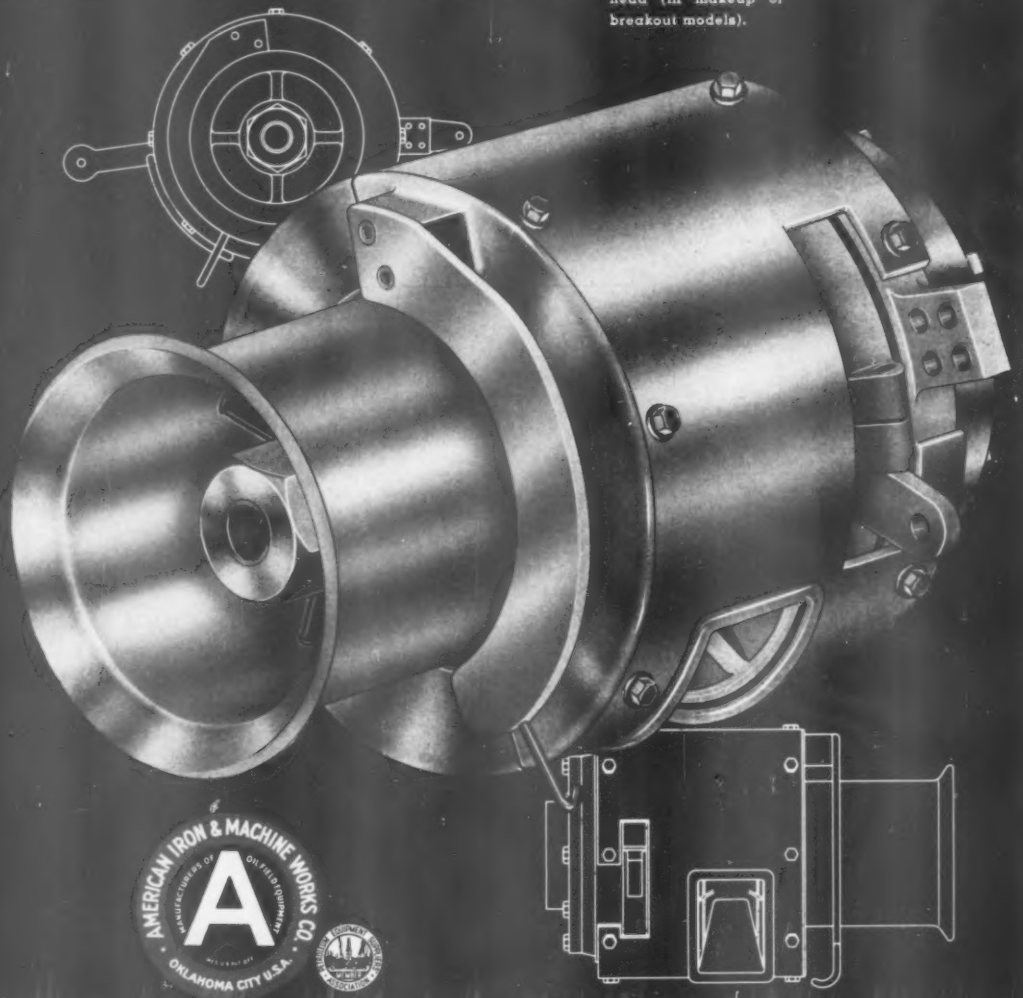

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DISTRICT OFFICE: HOUSTON, TEXAS
EXPORT OFFICE: 11 WEST 42ND STREET, NEW YORK CITY, N.Y.

TREND OVER THE LAST YEAR

	Western Hemisphere less U.S.	Middle East	Total foreign less Russia and E. Europe
September	2,396.3	1,741.7	4,517.6
October	2,395.6	1,810.6	4,585.6
November	2,383.7	1,940.4	4,709.5
December	2,404.9	1,846.3	4,633.1
January	2,432.3	1,832.8	4,653.5
February	2,438.8	1,860.1	4,692.0
March	2,437.8	1,996.5	4,813.8
April	2,459.6	2,090.8	4,933.2
May	2,527.6	2,142.1	5,059.9
June	2,517.8	2,208.9	5,117.6
July	2,494.6	2,126.1	5,018.3
August	2,426.8	2,096.7	4,923.2

ly unchanged during the month. Output by areas was: De Mares (Empresa), 35,039 bbl. daily; Barco, 27,304 bbl. daily; Yondo, 39,887 bbl. daily; Cantagallo, 1,225 bbl. daily; Dificil, 1,386 bbl. daily; and Velasquez, 4,238 bbl. daily.

Production in Kuwait in August fell nearly 100,000 bbl. daily to an average of 710,600 bbl. daily. The August total was only about 24,000 bbl. daily above the shaikhdom's output in August 1951, and was the lowest level since last February.

Another production drop, though less severe, occurred in Saudi Arabia where output fell nearly 34,000 bbl. daily to 816,600 bbl. daily. The major increase in the Persian Gulf was in Iraq. Production in Iraq reached a new record of 440,000 bbl. daily, 103,000 bbl. daily over the July average. Iraq production has been increasing since last spring when the new 30 and 32-in. pipe line from Kirkuk field was completed. In July, however, it declined nearly 82,000 bbl. daily.

Despite the increase in Iraq, total production in the Middle East was down to its lowest point since last April. The August total of 2,096,700 bbl. daily was about 29,000 bbl. daily below the previous month.

Tanker Rates Cut

The first reduction in 3 years has been made by the London panel of tanker brokers which assess time-charter rates semiannually. The latest of these so-called London awards was for 42s 3d ($5.92) a ton deadweight per month for the standard tanker.

This reduction of about 20 per cent brought the award down to the equivalent of roughly U.S.M.C. plus 35 per cent. The awards are used in the international industry to give a more stable rate than those on the spot market. The new reduction is expected to be reflected in cuts in prices for certain products abroad.

MIDDLE EAST

Iranian Break Final

Britain notified after week's delay; embassy in Teheran closes and Sweden prepares to represent Iran in London

THE Iranian Government officially severed diplomatic relations with Britain October 22 as an outgrowth of stalemated oil dispute.

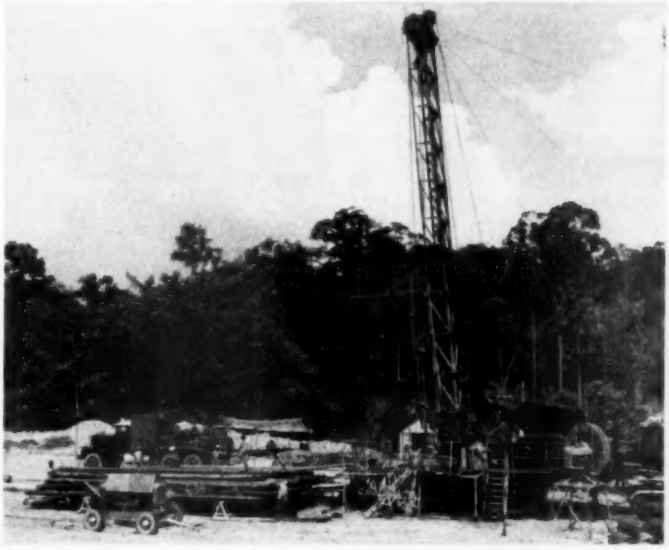
The Union Jack was hauled down at the British Embassy in Teheran, and in London Sweden prepared to represent Iran's interests. The final break came when Prime Minister Mossadegh, after a week's delay, notified Britain of his government's decision.

Such a step makes a settlement of the oil problem even more difficult. British-Iranian relations have become even more embittered by the recent 6 weeks' exchanges of notes, the latest of which was a firm British rejection of Dr. Mossadegh's demand to be paid $137,200,000 before beginning negotiations.

British patience wore thin by the time the last note was delivered. Apparently feeling the messages were getting nowhere, the British foreign office told Mossadegh that his counter-proposals were "unreasonable and unacceptable." It also declared Britain will continue to assert legal claim to any oil which may be exported from the nationalized properties.

British aid recalled . . . The foreign office in London took the unusual step of issuing statement on the British position along with release of the note to Iran. Referring to the deadlines set in Dr. Mossadegh's notes and his threats of ultimatums to Britain, the foreign office statement said such correspondence was "not usual" between friendly nations and was not likely to further friendly relations.

The statement reminded Iran of the "event of 1946" when Britain helped force Russia to evacuate its troops from northern Iran. It said Iran's fate



Drilling in Minas Field

One of the newest major oil fields to be placed on commercial production abroad is the Minas area of east-central Sumatra. Here is one of the two portable rigs which are being used to drill the approximately 2,500-ft. wells. Minas has an unusual history in that the Japanese made the discovery during the war by drilling a location which had been made by the company, Caltex Pacific Petroleum Co., before its personnel was evacuated. Development work carried out the last 3 years resulted in the first commercial shipment last May. The field's production is expected to average about 14,000 bbl. daily this year.

in the nineteenth century would have been very different had not Britain thrown its weight on the side of an independent nation.

By issuing this statement, Britain virtually conceded the failure of the new settlement effort which began late in August when a joint note was dispatched to Teheran over the signatures of President Truman and Prime Minister Churchill. This communication proposed that British compensation claims be submitted to the World Court and that the two countries work out some method of resuming operations of the industry.

In what probably is the final note, Britain said it recognized the nationalization of the properties but claimed compensation for the unilateral cancellation of the agreement which had until 1993 to run. Mossadegh's counterproposals besides asking $137,200,000, would have barred Britain from raising such claims other than for the value of the physical facilities at Abadan, and this would have been offset by various Iranian counterclaims such as for loss of revenue from its failure to sell oil since nationalization.

Editors' views . . . British press comment on the new turn in the situation varied. Some observers thought Dr. Mossadegh was prepared to return his country to a completely agrarian economy and let the oil industry remain idle indefinitely.

The London Times said the exchange of notes never had much change of success since each one was immediately made public. The Manchester Guardian said tankers could be on their way to Abadan at once if the Iranian Government was ready to negotiate on compensation. It said there must still be patriotic Iranians who do not accept their prime minister's "brand of national suicide."

The prospect of a break of diplomatic relations by Iran threatened the careers of about 900 Iranian students who are studying in British universities and technical colleges. In recent months Iran's financial difficulties have cut off funds from many of these students, and Dr. Mossadegh's proposed diplomatic break probably would force them to return to Iran. Ironically, the only ones remaining would be about 45 Iranians studying under scholarships from Anglo-Iranian Oil Co., Ltd., which is continuing to support the 3-year scholarships which it gave employes while still operating in Iran.

Mossadegh's decision to break relations was announced by radio October 16. His message was to have been addressed to the Majlis, but no quorum was present.

Makeshift Refinery Finished

A makeshift refinery capable of handling about 4,000 bbl. daily of crude oil has been erected on the outskirts of Basrah in southern Iraq to meet the product needs of this area until the large Iraq Government refinery at Baghdad comes into operation.

Construction was carried out by Khanaqin Oil Co. (Anglo-Iranian Oil Co., Ltd.), which will be in charge of the plant's operation. Materials were collected from various sources, and shell stills were fabricated from the top sections of the original stabilization units at Kirkuk field.

Crude oil from Zubair field of Basrah Petroleum Co., Ltd. (Iraq Petroleum Co., Ltd.), is being delivered through a 6-in. line that formerly brought refined products from the Abadan refinery in Iran.

The Iraq Government last December took steps for state operation of that part of its oil industry which serves local needs. It reached an agreement with Anglo-Iranian to take over the Alwand refinery of the Khanaqin company and the oil-distribution facilities of Khanaqin and Rafidain Oil Co., another Anglo-Iranian subsidiary. At that time, it was decided Khanaqin would manage the Alwand refinery and construct the Basrah plant pending completion of the large Baghdad refinery which is expected to have about 25,000 bbl. daily capacity.

Israel Fills Oil Post

I. R. Kosloff, fuel adviser to the Israeli Ministry of Finance, has been appointed petroleum commissioner and placed in direct charge of the administration of the new petroleum law passed recently by the Israeli Parliament.

The administration of the law itself has been placed under the direct supervision of Levi Eshkol, minister of finance, who will thus become the final arbiter on all matters of administration under the law.

In another move to implement provisions of the bill, the government has named four government officials and five business and professional men to membership on the petroleum board. This board was created under the law to pass on matters of policy.

Gat Kitron, assistant attorney-general of Israel, is now in the United States working with Max Ball and Douglas Ball, Washington, D. C., consultants, and other advisers, on the regulations to the law, which an Israeli announcement said probably will be published by November 1.

LATIN AMERICA

Concessions Offered

Peru awaits applications under new petroleum law

THE Peruvian Government is scheduled to begin this week accepting applications from foreign companies for concessions under the country's new petroleum law.

A number of companies have made careful studies of the law's provisions but which of them will actually take out concessions is not known definitely. The law establishes a 50-50 profits split for new ventures with credit for a 20 per cent export tax, among other features.

Companies reported to have shown an interest in possible Peruvian operations are International Petroleum Co., Ltd., the principal company in the country at present; Cia. de Petroleo Shell de Peru, S.A.; Socony-Vacuum Oil Co., Inc.; Conorado Petroleum Corp., Richmond Oil Co. of California (Standard of California); Union Oil Co., and Gulf Oil Corp.

Reports in Lima have been that the British-owned Cia. Petrolera Lobitos, the second largest company now in Peru, and Cia. Petroleo Ganzo Azul, which has a small integrated operation in eastern Peru and which is controlled by California interests, also may seek acreage under the new law.

Another possible entrant is Cerro de Pasco, the leading nonferrous mining company in Peru, which decided last August on an expansion into oil and gas operations when conditions are favorable. Argentine interests recently formed a company, Cia. Sudamericana de Petroleo, for Peruvian operations in connection with Peruvian capital. Fernando Madril, an Argentine, is president of this company.

Coastal areas preferred . . . Most of the interest under the new law will be in the coastal regions of the country, particularly the Sechura desert. Though the fees and other obligations on the concessionaire are lighter in the mountain and transmountain zones, a far greater investment would be required to develop production in these areas and transport it to seacoast for export.

The regulations drafted by the government to implement the law gave a preferential offering of up to 10 per cent of the prospective coastal acreage to citizens of Peru and national companies. Five applications, four of them

for concessions in the Sechura region and one in eastern Peru, were received August 11 during the period reserved for nationals.

Cia. Petrolera Peruana, S.A., Agusto Gildemeister, president, asked 180,000 h. in the Sechura; Cia. Petrolera San Miguel, Miguel Cilloniz, president, 75,000 h. in the Sechura; Cia. Petrolera Peruana San Lazaro, Carlos Debernadi, manager, 46,000 h. in the Sechura; Augusto N. Wiese and Fernando Wiese, 26,000 h. in the Sechura; and Cia. Peruana de Petroleo el Oriente, three concessions in the forest regions of eastern Peru totaling 51,500 h. This latter company has been exploring for oil in the Ucayali River region of eastern Peru for several years.

Pemex Confirms Major Field

Petroleos Mexicanos has brought in its fourth well in the new Ezequiel Ordonez field east of Poza Rica.

Preliminary tests show a production of from 5,000 to 7,000 bbl. daily. The new well gave further evidence that Pemex has made a major discovery and one which some geologists think may turn out to be the best made in Mexico in many years *(The Oil and Gas Journal, September 15, page 76)*.

The three oil wells completed thus far (the first well was high on the structure and produced gas) have a total estimated production of close to 20,000 bbl. daily, but full testing awaits completion of a pipe line now under construction.

Work in Ezequiel Ordonez, as well as elsewhere throughout central Mexico, has been retarded in recent weeks by prolonged heavy rains and floods. A number of drilling rigs have been forced to suspend operations, field and plant workers have been isolated in some areas, and distribution of products in the region has become extremely difficult in what is described as a sea of mud.

Creole Hikes Crude Prices

Creole Petroleum Corp. has advanced the price of six different Venezuelan crude oils by amounts ranging from 5 to 15 cents.

The increases were made in a new crude-oil price bulletin effective October 11. The crudes affected were: Bachaquero, up 5 cents to $1.66; Tia Juana heavy, up 5 cents to $2.03; Lagunillas heavy (a flat posting), up 5 cents to $2.05; Cumarebo, up 15 cents to $3.10; San Joaquin, up 10 cents to $2.91; Quiriquire, up 5 cents to $2.29; and Temblador, up 5 cents to $2.33.

EUROPE

Russia Raises Goal

Malenkov says 1952 output is 935,000 bbl. per day

THE Soviet Union has disclosed that its oil production this year will average about 935,000 bbl. daily.

The information was given recently by Georgi M. Malenkov, Politburo member and high Communist official, at the nineteenth party congress in Moscow. Malenkov's speech giving figures for a long list of Soviet industrial and consumer goods marked the first official disclosure of exact Russian production figures in several years.

Soviet oil production this year will amount to 47,000,000 metric tons (935,000 bbl. daily on the basis of the Bureau of Mines conversion factor of 7.27). Malenkov said this represents an increase of about 5,000,000 tons over last year, a gain of slightly under 12 per cent. As compared with oil production in 1940, this year's output will represent an increase of approximately 50 per cent.

1955 goal raised . . . The apparently rapidly increasing Russian oil production has caused Soviet authorities to make a major upward revision in the target goal. Where formerly Russia planned for 60,000,000 tons, or about 1,200,000 bbl. daily by 1960, the new Fifth Five-Year Plan calls for 70,000,000 tons, or 1,385,000 bbl. daily in 1955.

Most observers of the Soviet economy believe that this goal can be met. It calls for an annual gain in petroleum output of about 150,000 bbl. daily during the next 3 years. In addition, Russia is believed to be producing about 9,000 bbl. daily from shale oil, principally in Estonia, and other quantities of synthetic oil in hydrogenation plants.

The new Soviet production plans lay ever greater emphasis on output of strategic raw materials such as petroleum. Russian oil consumption is believed to about balance production since the surplus from the satellite areas, especially Romania and Austria, is offset against exports to other Russian allies in the Far East, mainly China.

Although Malenkov's data indicated that about half of Russian oil production is now coming from the Eastern regions of the Soviet Union, a substantial part of the oil output still comes from the Baku region. Recently the party secretary of Azerbaijan revealed an increasing part of production at Baku is being taken from offshore wells in the Caspian Sea.

However, he said that both inland and offshore drilling plans were not being fulfilled. He blamed this situation in part to "criminal elements in the submarine drilling combine" and mentioned the dismissal of three executives of the oil organization.

Products to Sao Paulo

Pipe-line construction in Brazil can be tough—especially in areas like this on the right-of-way to Sao Paulo. This 30-mile products system rises 2,500 ft. in 1.6 miles in ascending the escarpment back of the coast. The area is heavily forested and rainfall averages 145 in. a year. The system is aboveground and supported by concrete piers. It consists of a 10-in. line for light products and an 18-in. line for heavy fuel oil—both operated at high pressure. Charged with construction and operation is the Brazilian Government's Santos to Jundiai Railway. The system was placed in operation earlier this year.

AUSTRALIA

A.I.O.C. Refinery Started

Construction work was scheduled to start this month on the new 60,000-bbl. daily refinery of Anglo-Iranian Oil Co., Ltd., near Fremantle in Western Australia.

Work also is getting under way on an associated housing project and the dredging of a tanker channel in Cockburn Sound, to be carried out by Western Australian authorities.

A group made up of Kellogg International Corp., and Costain-John

Brown, British construction engineers, has been designated as the main contractor. The refinery is estimated to cost the equivalent of about $90,000,000.

AFRICA

Synthesis Plant Planned

Several Belgian Congo mining companies are experimenting with the possibility of commercial oil synthesis operations.

An experimental coal-to-oil plant is planned for construction in the Belgian Congo near Albertville. It will be in the vicinity of the Greinerville coal fields and will employ 400 natives. Among the mining companies backing the project are Union Miniere and Geomines. The Fischer-Tropsch process will be employed.

It was reported earlier that Lukuga Coal Syndicate had shipped several hundred tons of coal to Belgian for testing in connection with the possible erection of a oil synthesis plant. The tests were to determined the coal's adaptability for gasification and the most likely method.

Brussells reports also say that tests are now being carried out to determine the commercial possibilities of obtaining oil from bituminous rock deposits in the Congo.

International Briefs

A gas discovery by the state-owned Azienda Italiana Petroli (AGIP) near Ravenna at the eastern edge of the Po Valley in north-central Italy has been announced in Rome by the Italian Ministry of Industry and Commerce. The discovery was made at a depth of about 5,650 ft. Tests showed a production of about 3,500,000 cu. ft. daily.

A record total of crude oil was shipped in September from the Banias, Syria, tanker terminal of the new 30 and 32-in. Iraq Petroleum Co., Ltd., pipe line from Kirkuk field in Iraq. Seventy-four tankers loaded 1,100,000 tons in September compared to 840,000 tons in August. The September shipments amount to an average of about 278,000 bbl. daily.

Nederlandse Aardolie Mij. (Standard Oil Co. [N. J.] and Royal Dutch-Shell) have abandoned their latest deep test in the Netherlands. The well near the Friesian village of Ried in the vicinity of Franeker was dry at about 10,000 ft. The rig is to drill another well in southern Holland near Loon op Zand, north of Tilburg.

Modernized and improved facilities for handling petroleum and products have been officially inaugurated at the port of Lavere near Marseilles in southern France. The enlargement of the port was made necessary by expansion of the nearby refineries of Shell-Berre, Soc. Francaise de Raffinage, and Soc. Generale des Huiles de Petrole.

French and Moroccan contractors have begun preliminary work on a system of pipe lines which will supply products to the French-American military air bases being built in French Morocco. A recent report from Paris said the main line extending about 25 miles from the port at Casablanca and the Nouaceur airport would have a diameter of 50 cm. (nearly 20 in.). At Nouaceur, the line connects with a system of 20 cm. (about 8 in.) lines supplying the other fields. The program is being financed by the U. S. Government.

The Mexican affiliate of Sharpless Oil Co. has completed a producing oil well in Horcon field under its percentage-of-production contract with Petroleos Mexicanos. The well came after four dry holes had been drilled by the Mexican subsidiary, Sharmex. The well, Horcon 103, had an initiation production of about 450 bbl. daily and now is reported producing at a rate of 950 bbl. daily through a short pipe line to Pemex tanks. Sharmex has located Horcon 107 as an offset to No. 103.

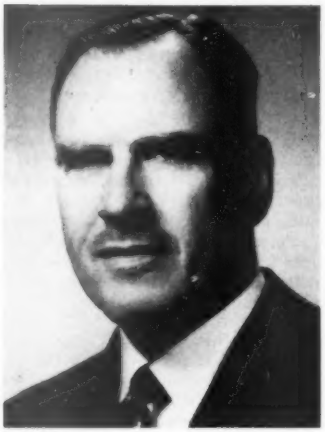
The Indonesian Parliament has opened discussion on the question of the return of the oil properties in North Sumatra to Bataafsche Petroleum Mij. (Royal Dutch-Shell). B.P.M. has not been able to gain access to the area since the end of the war owing to disturbed political conditions, and some of the facilities have been operated by local Indonesian interests.

The new refinery of about 10,000 bbl. daily which is being built in Holthausen, West Germany, is expected to be completed about August of next year. The plant, which will process crudes from the Emsland district of West Germany, is to be operated by Gewerkschaft Erdoelraffinerie Emsland. A system of pipe lines from the various fields to the refinery will be built and operated by Emsland Erdoelleitung, GmbH. The main part of this system is expected to be finished early next year.

A 9,789-ton British liner will be used as a floating hotel to quarter about 300 technicians and workmen who will be engaged in the construction of the new 100,000-bbl. daily refinery of Anglo-Iranian Oil Co., Ltd., at the British colony of Aden. The vessel recently took on stores and rations at Liverpool for a lengthy stay at its new base. Most of the construction personnel probably will travel to Aden in the ship.

Guests of the New York Nomads

Foreign visitors attending the Stork Club party this month of the New York chapter of Nomads included, left to right, Harry Kerr, Gulf Oil Corp., Tunisia; J. R. Johnson, I.G.E.S.A., Bogota, Colombia; W. O. Woelgesy, The Texas Co., Caracas, Venezuela; Ian Herrera, Trinidad Oilfield Service, Ltd., Trinidad; George Broadbent, General Motors Overseas Corp., Karachi, Pakistan; and Frank King, The Texas Co., Caracas, Venezuela. At right is H. A. McGurty, Standard Oil Co. of California, San Francisco.



Industry Leader

Pacific association head is active in gas affairs

JAMES S. MOULTON, the new president of the Pacific Coast Gas Association, has played a leading role in the gas industry.

Moulton, vice president and executive engineer for Pacific Gas & Electric Co., San Francisco, was elected head of the association last month. He succeeded W. M. Jacobs, vice president of Southern California Gas Co.

A past director of the American Gas Association, he now is a member of the advisory council. He was instrumental in Pacific Gas & Electric's introduction of out-of-state natural gas to Northern California through construction of its $63,000,000 pipeline. This line takes gas from El Paso Natural Gas Co.'s West Texas-to-California big-inch line at Topock, Ariz.

He began his career in 1921 following graduation from Yale University when he became assistant to the executive engineer of San Joaquin Light & Power Corp. at Fresno. He was made executive engineer of the affiliated Great Western Power Co. in 1927. Three years later when Great Western and San Joaquin merged with Pacific he became assistant to the vice president and assistant general manager.

During World II he served 3 years as assistant public works officer of the twelfth naval district, with rank of commander. He was appointed executive engineer in 1946 and promoted to his present position in 1947.

W. W. Cofield, engineer for Transcontinental Gas Pipe Line Corp., has been transferred from Linden, N. J., to El Campo, Tex.

Robert Horton, formerly a geologist for Bishop Oil Co. in Kansas, has been appointed engineering assistant to the general manager at San Francisco. **Burr M. Roberts,** senior geologist, has been transferred from Scottsbluff, Neb., to Billings, Mont., by the company. **Marvin E. Frankamp** has joined the geological staff at Wichita, and **Tex Luthy** has been appointed a geologist at Bismarck, N. D.

Floyd E. Suder, Jr., reservoir engineer for Ohio Oil Co. at Tulsa, has been transferred to Houston.

DR. W. J. McGILL

Dr. William J. McGill, assistant general manager of manufacturing for Standard Oil Co. (Ind.), has been appointed general manager of industrial and public relations. Dr. McGill, who joined Standard in 1924 as a chemist at the Whiting, Ind., refinery, has served as manager of the Wood River, Ill., refinery, manager of the Whiting refinery and superintendent of manufacturing operations in the company's general office at Chicago. His place in the manufacturing department will be taken by **J. C. Ducommun,** manager of the refinery at Whiting. **A. F. Endres,** general superintendent, will become manager at Whiting, and **A. H. Hayes** will move up from assistant general superintendent to general superintendent.

Edward P. Burtchaell has been appoined reservoir engineer for Kern County Land Co. at Bakersfield, Calif. He formerly was with Honolulu Oil Corp. in San Francisco.

James P. Dunnigan, Producers Refining Co., Inc., West Branch, Mich., has been elected a new director of the Oil and Gas Association of Michigan. Also elected for a 2-year term were **W. F. Eiting,** Carter Oil Co.; **Robert L. Tope,** Mt. Pleasant, independent producer, and **Lud Segerlud,** Harrison independent.

D. M. Steel, Billings, Mont., has been elected vice president of Geotechnical Corp. of Delaware at Dallas. He will be in charge of operations in the Rocky Mountain and Williston basin areas.

James L. Bowen, production engineer for Shell Oil Co., has been transferred from New York to Long Beach.

Harold Vance, head of the petroleum engineering department of Texas A. & M. College, and a consulting engineer and independent operator, has been appointed head of the oil and gas division of the Second National Bank of Houston. Before joining the faculty at A. & M., he was associated with United Oil Co., the U. S. Bureau of Mines, and Continental Oil Co.

Elmo B. Pope, formerly tool pusher for O'Neal Drilling Co., at Fort Worth, has been appointed tool pusher for Brahaney Drilling Co. at Lovington, N. M.

Peter F. Chapman, reservoir engineer for Shell Oil Co., has been transferred from Centralia, Ill., to Wichita Falls, Tex.

Kenneth E. Burg, vice president of Geophysical Service, Inc., Dallas, and **Roy L. Lay,** manager of the geophysi-

K. E. BURG

ROY L. LAY

cal division of The Texas Co., Houston, have been nominated for the presidency of the Society of Exploration Geophysicists for 1953-54. Balloting will be by mail and the results will be announced next February. Vice presidential nominees are: **Dr. Karl Dyk,** chief geophysicist, Stanolind Oil & Gas Co., Tulsa, and **Eugene W. Frowe,** laboratory chief, Robert H. Ray Co., Houston. **W. B. Robinson,** geophysical supervisor for the Tulsa division of Gulf Research & Development Co., and **Bart W. Sorge,** vice president for United Geophysical Co., Pasadena, Calif., are nominees for secretary-treas-

PERSONALS

urer: **Dr. Milton B. Dobrin,** senior research physicist for Magnolia Petroleum Co., Dallas, and **Dr. L. Y. Faust,** geophysicist for Amerada Petroleum Corp., Tulsa, for the 2-year term as editor.

Fred L. Gaye, drilling and mud engineer for Sunray Oil Corp., has been transferred from Alice, Tex., to Lake Charles, La.

Joe A. Laird has resigned as petroleum-engineering professor at Texas A. & M. College, College Station, to open consulting offices in Houston. He formerly was a geologist and petroleum engineer for **George W. Strake,** Houston independent operator, and district engineer for the Texas Railroad Commission in Houston.

John K. Gill, Okmulgee, Okla., independent oil operator, has been elected president of the Okmulgee District Oil and Gas Association.

Stewart M. Jones, formerly assistant geology professor at New Mexico Institute of Mining and Technology, Socorro, has been appointed a geologist for Shell Oil Co. at Tucson, Ariz.

P. E. TALIAFERRO

Paul E. Taliaferro has been appointed executive vice president of Sunray Oil Corp. by the board of directors. Taliaferro, who is a director, has been serving as vice president and assistant to the president. **H. O. Harder,** who since May 1949 has been vice president and manager of the Mid-Continent production division, has been named vice president and manager of the exploration department, including the geological and land divisions in both Mid-Continent and California areas. **R. E. Foss,** vice president for the California division at Los Angeles, will move to Tulsa as vice president and manager of the exploitation department, including drilling and production activities throughout the Mid-Continent states and California. **H. W. Manley,** vice president and manager of the company's manufacturing, sales, and pipe-line division since last May, will also assume management of these activities in California. Manley formerly was vice president in charge of production and natural-gasoline plants.

Wins Highest Navy Award

B. BREWSTER JENNINGS, left, president of Socony-Vacuum Oil Co., Inc., New York, is shown as he received the Secretary of the Navy's Distinguished Public Service Award, the highest award the Navy may confer on a civilian. Presenting the award is Secretary of the Navy Dan A. Kimball. The citation, in part, praised Jennings' "important role" in supplying petroleum for the Allied fighting forces.

Allen H. Ilfrey, senior petroleum engineer in the Houston office of Humble Oil & Refining Co., has been transferred to the Southwest Texas division office.

O. L. Odale, chief mechanical engineer for Shell Oil Co. in the Houston area, has been transferred to New York on a training problem. He has been replaced by **W. E. Harpst,** chief mechanical engineer in the New Orleans area.

L. C. Powell has been named acting exploration superintendent at Shreveport for the North Louisiana-South Arkansas district of The California Co. **J. E. McCall** has been appointed district exploration superintendent of the newly formed South Alabama-Georgia-Florida district, with headquarters in Pensacola, Fla.

Arthur F. Turman has been appointed chief petroleum engineer for the producing department of Standard Oil Co. of California at San Francisco, succeeding **W. A. Eardley. J. T. Crooker,** supervising petroleum engineer for the producing department at Taft, Calif., has been named to succeed Turman as assistant chief petroleum engineer at San Francisco.

Frank E. McGonagill, petroleum engineer for Stanolind Oil & Gas Co. at Corpus Christi, has been appointed a petroleum engineer for the Second National Bank at Houston.

George Walter, who has been manager of the Iraq Petroleum Co. refinery in Tripoli the past 3 years, has retired after 20 years with the company. He aided in planning construction of the firm's original 12-in. crude-oil pipe line from Iraq to Tripoli, and was manager at Baghdad for 9 years. He is a fellow of the Institute of Petroleum.

B. G. Martin has resigned as assistant to the vice president of Gulf Oil Corp., effective November 1, to become president and director of San Jacinto Petroleum Corp. The company has moved its principal offices from Dallas to Houston. It was organized in 1950 to acquire the bulk of the properties formerly held by Atlatl Royalty Corp.

Rex C. Cabaniss, junior exploitation engineer for Shell Oil Co. at Houston, has been promoted to exploitation engineer at Hobbs, N. M.

Fred C. Hanker, Jr., has been appointed chief process engineer for Ehrhart & Arthur, Inc., refinery-engineering company, Los Angeles. He formerly was assistant to the president of Catalytic Construction Co., Philadelphia.

O. W. White, Jr., intermediate petroleum engineer for Sinclair Oil & Gas Co. at Delaware, Okla., has been transferred to Covington, Okla. Other company changes include: **Clayton Walker,** junior petroleum engineer at Tulsa, transferred to Independence, Kans.; **Robert R. Marmor,** intermediate petroleum engineer at Delaware, Okla., transferred to Tulsa; **Paul J. Dorris,** roustabout at Thrall, Kans., promoted to junior petroleum engineer; **John N. Eibeck,** roustabout at Ardmore, Okla., promoted to junior petroleum engineer; **Neal G. Turner,** roustabout at Covington, promoted to junior petroleum engineer at Delaware, and **David G. McMunn,** roustabout at Covington, Okla., promoted to junior petroleum engineer at Kiefer.

PERSONALS

W. G. Iverson, Kansas district geologist for Continental Oil Co. in Wichita the past 4 years, has resigned to become chief geologist for Derby Oil Co.

Bob Kazarian, exploitation engineer for Shell Oil Co. at Los Angeles, has been transferred to Baker, Mont.

G. W. Orton has been appointed resident director of the affiliated companies of California Texas Oil Co. in the United Kingdom. In addition to coordinating the activities of Caltex firms in England, he also will serve as director on the board of Regent Oil Co., Ltd. Orton, who joined the Caltex group this year, formerly served as general manager of foreign operations for The Texas Co.

L. W. Baker, Tulsa, has organized the L. W. Baker Drilling Co. He formerly was a partner of O'Rourke-Baker Drilling Co., which has been dissolved.

Robert H. Multhaup has been appointed manager of the product-engineering department of M. W. Kellogg Co., designers and builders of petroleum and chemical processing plants. Multhaup joined the firm last year as project engineer on rocket-design work.

Lee R. Riley, geologist for Carter Oil Co. at Oklahoma City, has been placed in charge of a new area office at Ardmore, Okla.

Glynn A. Clark, petroleum engineer for Ohio Oil Co. at Shreveport, La., has been transferred to the company's general offices at Findlay, Ohio.

C. F. Foster, production foreman for Skelly Oil Co. in the Cunningham district, has been transferred to the Meade, Kans., district.

James A. Scanlon has been elected a member of the board of directors of Ohio Fuel Gas Co. Since last February he has been vice president in charge of rates and regulations. **John A. Bieber** has been elected an assistant vice president.

R. C. Hunt, engineer for Texas Eastern Transmission Corp., has been transferred from Athens, Ohio, to Lufkin, Tex.

L. L. Taylor, formerly field foreman for Sun Oil Co. at Carthage, Tex., has been appointed plant engineer at Delmita, Tex.

Frank H. Clements, field engineer for Stanolind Oil & Gas Co., has been transferred from Andrews to North Cowden, Tex.

Joseph E. Warren, research engineer for Stanolind Oil & Gas Co. at Tulsa, has been appointed a research fellow for Stanolind at Pennsylvania State College, State College, Pa.

J. W. (Jack) Harding has resigned as assistant chief geologist for Hancock Oil Co. to begin consulting work. He formerly was with Union Oil Co. at Bakersfield and Santa Paula, Calif. He has set up temporary offices at Long Beach.

Justin J. Dunn, production superintendent for Kingwood Oil Co. at Pauls Valley, Okla., has been promoted to division superintendent at Oklahoma City.

John L. Enos, engineer for Sohio Petroleum Co., has been named a Fulbright student and is studying the operation of the oil industry in The Netherlands.

G. A. Reynolds, production foreman for Stanolind Oil & Gas Co. at Ellinwood, Kans., has been named field superintendent for the Gorham, Kans., area. He succeeds the late C. B. Snyder.

DEATHS

Ernest R. Woodmansee, manager of tool-joint sales for Hughes Tool Co., died recently in a Houston hospital. He was a tool pusher in the Gulf Coast area, and a sales engineer for Electrical Engineers Equipment Co. of Illinois before joining Hughes in 1933.

Donald H. Lycan, 63, vice president and director of Signal Oil & Gas Co., died recently in Rome, Italy, while on a European trip. For many years he has been in charge of the land and geological department of the company.

C. P. Watson, land man for Bay Petroleum Corp., died October 16 at his home in Denver. He formerly was division land man for Sinclair Oil & Gas Co. at Casper, Wyo.

Fred H. Haggerson, 68, chairman of the board of Union Carbide & Carbon Corp., died in New York City October 14. He was elected vice president of the corporation in 1938, a director in 1941, and president and a member of the executive committee in 1944.

Roy L. Fisher, 55, Jackson, Miss., driller, died October 18 at Monroe, La.

Benjamin F. Harris, 66, former president of United States Steel Corp.'s National Tube Co., Oil Well Supply Co., and Tubular Alloy Steel Corp., died October 15 at Pittsburgh. He had been associated for more than 30 years, until 1943, with companies forming a part of the U. S. Steel.

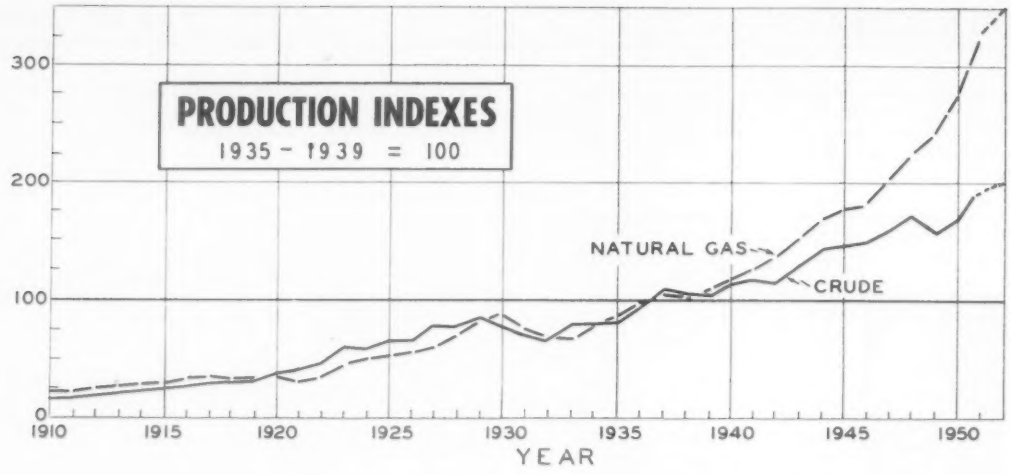
Benjamin Lewis Mouser, 61, Valley City, Kans., head of Mouser Drilling Co., died October 19 in a Wichita hospital.

Leonard M. Strait, 70, formerly an employe of Pure Oil Co. at Tulsa, died of a heart attack at Tulsa October 18.

James Thomas Lowen, 62, rotary driller, died recently in a Long Beach hospital.

William Hearne Harper, 70, Shreveport oil driller, died there October 15 after a brief illness. He was credited with drilling the discovery well in Spindletop field in Texas, and later brought in the discovery well in the Jennings, La., field. In recent years he had been engaged in brokerage of leases and royalties.

Frederick R. Ryan, 73, who retired last May after 25 years as president of American Maracaibo Co., died October 15 at his home in New York. He was the surviving member of the law firm of McCombs & Ryan.



Natural-Gas Consumption Increasing

Relative consumption increase has been greater than for any other fuel during the postwar period; expansion is due to the fact that natural gas is the country's biggest fuel bargain

by John C. Casper
Associate Editor

THE outstanding growth in the use of natural gas in the postwar period is a definite indication that natural gas has been the big fuel bargain of the country. The percentage gains by natural gas have been much greater than for either petroleum fuels or coal.

Marketed production of natural gas increased 83 per cent in the 5-year period from 1946 through 1951. In the same period crude gained 30 per cent. Production of coal, bituminous and anthracite, in 1951 was 2.9 per cent less than in 1946. Natural gas customers of utilities increased 6,800,000 in the 5-year period.

Total marketed production of natural gas in 1946 had an energy value equivalent to only 39 per cent of the energy in the crude petroleum produced that year. By 1951 natural gas had moved up to 55 per cent of crude, based on energy values. Also, the gain for natural gas on an energy basis was greater for the 5-year period than the total increase in crude production. The gain in natural gas production was equivalent to an increase of 561,000,000 bbl. of crude compared with an actual increase in crude production of 511,000,000 bbl.

Customer gain . . . The average number of customers, buying natural gas from utilities in 1946 was 9,366,000, and this had grown to 16,143,000 for 1951, according to data compiled by the American Gas Association. At the end of June 1952 there were 18,100,000 customers representing 71.2 per cent of total gas customers compared with a natural gas portion amounting to 63.7 per cent at midyear 1951. This increasing percentage reflects the continuation of conversions from manufactured and mixed gas to natural.

Latest figures by the Bureau of Mines show total marketed production of 7.46 trillion cubic feet of natural gas in 1951 for an increase of 18.7 per cent over 1950. Marketed production in the first half of 1952 totaled about 4 trillion cubic feet, indicating another new record for this year.

The expansion program for the natural gas industry based on recommendations of the Petroleum Administration for Defense calls for an increase of 11.4 per cent in natural gas for utilities in 1953, 6.5 per cent in 1954, and 5.2 per cent in 1955. Marketed production may exceed 10 trillion cubic feet for 1955.

Relative gains in the production of natural gas roughly paralleled the growth by crude oil in the period from 1910 to about 1941. On the accompanying chart changes in production of crude and natural gas are shown as production indexes with the average output for the years 1935-1939 used as a base of 100. It will be noted that the expected gas production for 1952 is about 3.5 times the average production in the reference period. Crude production in 1952 will be only twice the average for the 1935-1939 period.

Production area shift . . . In the past 30 years there has been a decided

CONSUMPTION OF NATURAL GAS BY USES

(Expressed as per cent of total consumption)

	Domestic	Commercial	Industrial
1930	15.2	4.2	80.6
1931	17.5	5.1	77.4
1932	19.2	5.6	75.2
1933	18.2	5.5	76.3
1934	16.3	5.2	78.5
1935	16.4	5.2	78.4
1936	15.9	5.2	78.9
1937	15.5	4.9	79.6
1938	16.0	5.0	79.0
1939	15.8	4.8	79.4
1940	16.7	5.1	78.2
1941	15.7	5.2	79.1
1942	16.4	6.0	77.6
1943	15.6	6.0	78.4
1944	15.2	6.0	78.8
1945	15.6	5.9	78.5
1946	16.5	6.0	77.5
1947	18.1	6.5	75.4
1948	18.1	6.5	75.4
1949	19.1	6.7	74.2
1950	19.9	6.4	73.7
1951	20.8	6.5	72.7
1952 (6 Mo.)	25.0	7.5	67.5

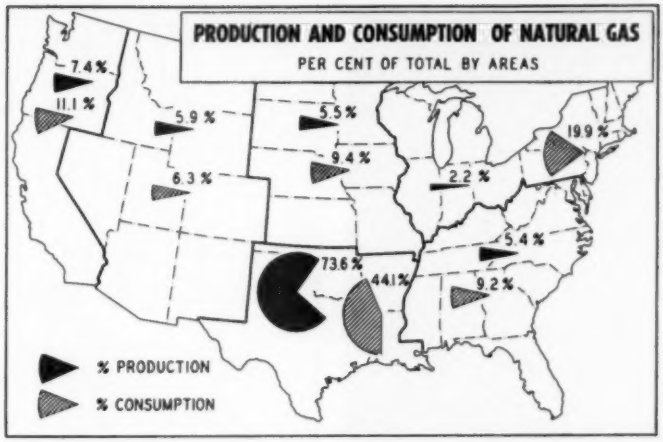
shift in gas production by areas. The accompanying table shows percentage of total production by states by years. Texas produced only 4.6 per cent of our natural gas in 1920 but accounted for more than half of the total in 1951 and in the first half of 1952. On the other hand, West Virginia dropped from 30 per cent of the total in 1920 to 2.2 per cent this year. The growth in Louisiana has followed the general national trend since 1935. In that year Louisiana produced 13 per cent of the total, and since that time has never produced more than 14.4 per cent nor less than 11.9 per cent of the total for any year.

Since the end of the war there has been a trend toward increased consumption of natural gas in those areas located away from the important gas producing fields. The area north of Kentucky, West Virginia, and Maryland and east of the Mississippi River, consumed almost 20 per cent of total natural gas marketed last year. This area used only 14.7 per cent of the total in 1945.

The pipe-line expansion program that followed the last war made it possible to increase gas consumption, particularly in northern and eastern states and in California. Gas from the southwest pushed California's consumption up to 11 per cent of the total in 1951 when the state accounted for less than 8 per cent of total production.

Despite the gains reported for northern and eastern states in postwar years, there is still plenty of room for expansion in gas use. This area which consumes only about 20 per cent of all natural gas has 46.4 per cent of the nation's population.

The big four-state producing area, including Texas, Louisiana, Oklahoma, and Arkansas, produces almost 74 per cent and consumes about 44 per cent of all natural gas despite the fact that the area has only 14.7 per cent of the population.



Trend shift . . . Aside from the trend toward greater total gas consumption, there seems to be evidence of a shift within the industry toward higher ratios of residential and commercial consumption and smaller relative gains for industrial use.

Industrial use represented about 78.5 per cent of total consumption in 1945 but had decreased to about 72.7 per cent by 1951. Domestic use climbed from 15.6 per cent to 20.8 per cent in the same period.

The larger relative gains for domestic consumption came after the postwar pipe-line program brought natural gas to new areas in the north and east.

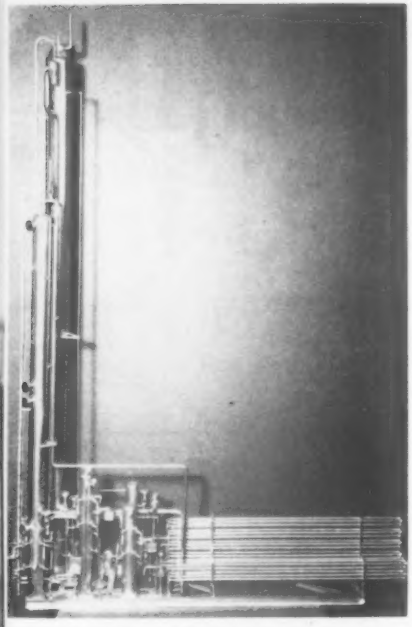
Price increases . . . The trend toward larger increases in domestic use and also the greater relative gains in the north and east have resulted in much larger gains in average value of gas at points of consumption than gains in well-head value. The value at points of consumption averaged 29.8 cents per thousand cubic feet in 1951 for an increase of 3.3 cents over the 1950 average. The average value at the well was 7.3 cents for 1951 compared with 6.5 cents for 1950.

Although the gain of 0.8 cent per thousand in the average value at the well was one of the largest increases recorded during one year, most of the gain was lost through devaluation of the dollar. In terms of 1950 dollars, adjusted on the basis of wholesale prices of all commodities, the average price at the well for 1951 was 6.56 cents or a gain of less the 0.1 cent over 1950.

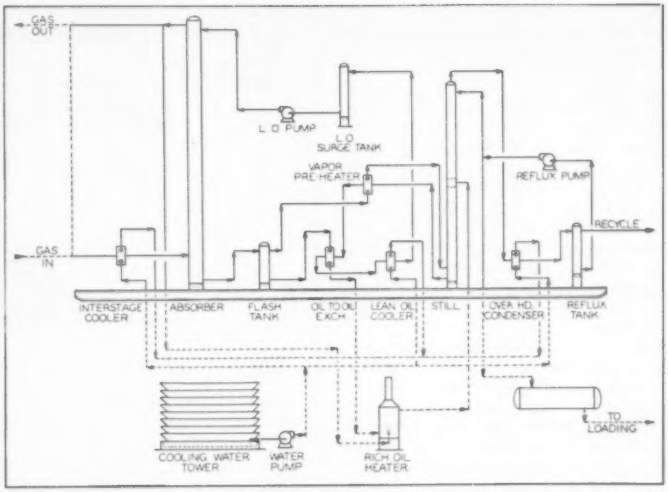
RELATIVE POSITIONS OF GAS-PRODUCING STATES
(Expressed as Per Cent of Total Marketed Production)

	Texas	Louisiana	California	Oklahoma	Kansas	New Mexico	West Virginia	Mississippi	Other states	Total U. S. production (M.M.c.f.)
1920	4.6	7.3	8.3	19.4	2.7		30.0		27.7	798,210
1925	11.3	12.8	15.8	21.0	2.3		15.2		21.6	1,188,571
1930	26.6	14.3	17.2	17.9	1.9	0.5	7.4		14.2	1,943,421
1935	33.5	13.0	14.8	14.3	3.0	1.5	6.0	0.5	13.4	1,916,595
1936	33.9	13.4	14.8	12.9	3.2	1.6	6.4	0.5	13.3	2,167,802
1937	35.5	13.1	13.7	12.3	3.5	1.9	6.2	0.6	13.2	2,407,620
1938	38.4	12.4	13.7	11.5	3.3	2.2	5.9	0.6	12.0	2,295,562
1939	39.5	11.9	14.7	10.1	3.3	2.4	6.4	0.6	11.1	2,476,756
1940	40.0	12.9	13.2	9.7	3.4	2.4	7.1	0.2	11.1	2,660,222
1941	38.6	14.4	13.3	8.3	4.0	2.3	7.4	0.2	11.5	2,812,658
1942	38.3	14.7	13.2	8.8	3.7	2.5	7.0	0.1	11.7	3,053,475
1943	38.8	14.8	13.4	8.3	3.9	2.5	6.6	0.1	11.6	3,414,689
1944	41.0	14.4	13.5	8.4	4.3	2.4	4.9	0.1	11.0	3,711,039
1945	43.7	13.8	12.8	9.1	3.7	2.7	4.1	0.1	10.0	3,944,021
1946	44.1	13.0	12.1	9.5	4.1	2.9	4.4	0.2	9.7	4,049,925
1947	43.5	12.9	12.3	8.8	4.5	3.2	4.1	0.9	9.8	4,582,173
1948	44.5	13.3	11.1	9.3	4.8	3.8	3.9	1.2	8.1	5,148,020
1949	47.8	13.5	10.2	8.0	5.4	3.8	3.3	1.3	6.7	5,419,736
1950	49.8	13.2	8.9	7.7	5.8	3.4	3.0	1.8	6.4	6,282,060
1951	51.3	13.8	7.4	7.9	5.5	4.1	2.5	2.1	5.4	7,457,359
1952 (6 months)	51.6	13.3	6.2	8.9	5.4	4.5	2.2	2.0	5.9	*4,005,800

*Preliminary figures for 6 months by Bureau of Mines.



SCALE MODEL of portable natural-gasoline plant. Photo shows typical layout. Fig. 1.



FLOW SCHEME of the portable plant. Dimensions of skid-mounted equipment are 8 by 25 ft. and within highway height limitations. Fig. 2.

- **Small investment**
- **Portability**
- **Adaptability . . . Three reasons why**

Portable Gasoline Plants Gain in Popularity

Automatic, low-cost operation, high salvage value also help

by Charles B. Barry*

FLEXIBLE, highly mobile natural-gasoline plants are giving some operators big advantages over others.

A producer can now make an installation in a field with a minimum of financial risk, before a major plant is justified. Thus, with a limited risk he can develop a favored position in the field and control the expanding gas production, if it develops.

The trend toward the packaged plant has been brought about by the increased use of light hydrocarbons and firmer markets for them. The production of natural gasoline and cycling plants for January 1952 averaged 614,000 bbl. per day,[1] as compared with the 1941 production of about 200,000 bbl. per day.

For the packaged unit to be practical, the plant should require a small investment, be as readily transportable as a drilling rig, and be applicable to a number of situations.

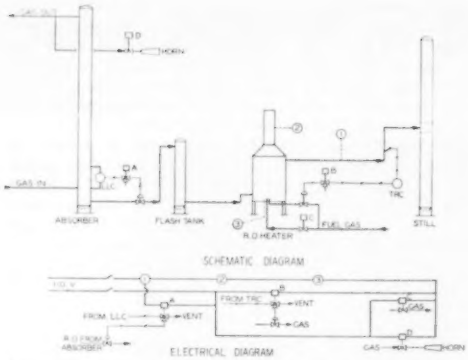
*Blaw-Knox Construction Co., Tulsa. Presented at annual petroleum engineering conference, Kansas City, September 22/24, A.S.M.E.

Design Considerations

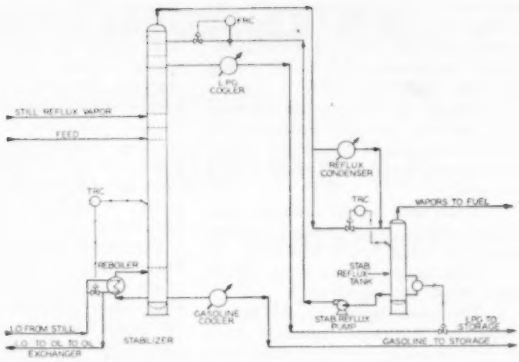
It is not practical to treat each packaged unit individually as would be the case in a major plant installation. Accordingly, the basic process and layout must be chosen to fit average conditions. Furthermore, a great number of engineering details must be standardized in order to engineer and procure such a unit with maximum economy. The design then becomes a matter of compromise among recovery, investment, and operating costs.

In order to minimize operating costs, it is necessary that the plant operate without constant attendance. For example, the operating expenses for a plant making 3,000 gal. per day should be in the order of $7,000 per year to achieve a 3-year payout after taxes, interest, and royalty payments. These expenses include labor, utilities, insurance, mineral seal oil, and maintenance. Obviously, an extremely complicated plant, with a number of operating units, cannot meet the payout requirements. A further requirement of simplicity is imposed inasmuch as most plants must be designed for operation by lease men who are not accustomed to operating complex process units. Since the plants must be automatic, steam boilers must be eliminated, because codes governing boiler operation require constant attendance by boiler firemen.

High C_5 recovery . . . The recovery of pentanes can be as high as 90 to 95 per cent of the pentanes fraction in the gas if the oil circulation in the plant is adequate. The packaged unit described here will make grade gasoline within certain limits, and means of adding equipment for manufacture of L.P.G. will be discussed. However, in general, L.P.G. production is not profitable unless it amounts to several thousand gallons per day, if finished products are to be sold, care should be taken to ascertain whether or not the products will meet the N.G.A.A. specifications for sulfur content, since chemical treating will add greatly to the investment and cost of operation.



SCHEMATIC LAYOUT of automatic shut-down system. Fig. 3.



FLOW DIAGRAM showing modifications for L.P.G. manufacture. Fig. 4.

Packaged plants are lower in first cost because the concrete foundations, the erection, and piping work have all been simplified. Additionally, shop fabrication and assembly is cheaper than field work. Therefore, a maximum amount of shop fabrication is specified, including insulation of vessels and piping. The complete shop-fabricated unit is usually shipped prepared in advance.

From a contractor's viewpoint, packaging also reduces installation costs by minimizing his indirect costs, which could easily run $6,000 to $8,000 on a complete field job of the scope discussed here. Most suppliers will quote engineering, procurement, and shop fabrication, leaving the actual installation of the unit to the customer. The economic advantage of a package unit is not limited entirely to its low initial installation cost. Its advantage also lies in the fact that 80 to 90 per cent of the investment can be recovered and reused when it is desirable to move the unit. The major loss is in the simple concrete foundations required.

Design musts . . . It has been indicated that design of these units involves considerable compromise; however, there are design factors which should not be compromised. A packaged plant should be engineered for safety, which means that:

1. The design should be made in

Factors Which Influence Selection of Process

During the last 10 or 12 years, the oil-producing states have progressively tightened restrictions on gas wastage and the oil industry has been compelled to utilize the gas in order to produce the oil. The processed gas is used principally for gas lift, repressuring, recycling, or it is sold to pipe lines. The greater percentage of this pipe-line gas is processed through gasoline plants which are "paid out" by hydrocarbon recovery; however, a considerable quantity of gas is sold without extracting the salable hydrocarbons.

Natural-gas transmission companies are aware that formation of hydrocarbon condensate in their lines is expensive and hazardous. When a liquid accumulates in the transmission line in the form of droplets or as pools in low sections, the line efficiency drops. Generally, this occurs at a time when the capacity of the line is most urgently needed, during the peak winter loads. In order to remove the condensate, it is necessary to install and operate drips at the low points in the line. This requires manpower and increases the cost of transportation.

For these reasons, it is desirable to prevent condensation by removing the components which could condense during winter operating conditions. Gas containing not more than 0.2 gal. of gasoline per thousand standard cubic feet by the standard charcoal test is generally considered suitable for pipe-line delivery, and it is anticipated in the future more contracts will be written to limit the gasoline content to 0.2 gal. per 1,000 standard cubic feet. In view of this, the industry will install a number of field processing units to meet contract requirements and to satisfy an ever-expanding light hydrocarbon market.

Four Basic Processes

There are four basic processes which can be used to remove gasoline from natural gas. These are compression, absorption, adsorption, or refrigeration or any combination of these four. Each process has an important place in the natural gasoline field and has specific advantages. The choice of an optimum process depends upon the special conditions of each application. The choice can be made on evaluation of alternate designs or by long experience with the combinations of processes by which the desired extraction can be obtained.

Some of the more important variables which are encountered are: (1) Gasoline content of the inlet gas measured by a charcoal test may vary from 0.3 to more than 10 gal. per thousand cubic feet; (2) gas can be taken from wells operating with a well-head pressure varying from several inches of vacuum to several thousand pounds; (3) the gas can be utilized at pressures varying from 50 psig. for sales to carbon-black plants up to 4,000 psig. on some recycling situations; (4) water and electrical power may or may not be available; (5) the gas processed may require treating or dehydration to remove water and hydrogen sulfide; (6) the plant owner may want to eliminate use of compressors or may wish to operate the plant in conjunction with a compressor installation; (7) the economics of the situation may dictate extractions varying from 80-90 per cent of the gasoline to 80-90 per cent of the propane in the inlet gas; (8) market conditions may require selling any number of finished products which may or may not require chemical treatment and dehydration.

accordance with the proper codes, including A.P.I.-A.S.M.E. for pressure vessels and tanks, T.E.M.A. for heat exchanger equipment, A.S.A. for piping and other applicable codes.

2. "Bottled up" designs, which reduce first cost but are poor economy for the operator, should be avoided, otherwise inspection of the equipment cannot be made.

3. Maximum use of welded pipe, flanged joints, and welded fittings should be made.

4. Explosionproof electrical equipment should be employed.

5. The plant layout should be arranged for maximum protection from fire by locating gas-fired equipment and internal combustion engines at least 100 ft. from the unit and arranging the layout to take advantage of prevailing winds, so there will not be a ready source of ignition for escaping hydrocarbons.

6. The cooling tower should be installed so the prevailing winds will carry the spray away from the plant thus reducing external corrosion, and simplifying housekeeping. The packaged plant itself should be planned for ease of maintenance and the layout should be made to allow ready access to the various operating units.

Standard unit . . . After considering all these variables, the oil-absorption process was chosen as an easily packaged process which was adaptable to the largest number of process conditions. This plant was designed to operate in conjunction with compressors operating to boost casing-head gas to sales-gas pressure or used in repressure or gas-lift situations.

The standard unit described here has been designed to process 5,000,000 cu. ft. per day of inlet gas at 150 psig., and circulate 25 g.p.m. lean oil which will extract approximately 90 per cent of the pentanes. At higher pressures the unit will handle a greater volume of gas or extract a greater percentage of product. Fig. 1 is a picture of a scale model. The unit is completely prefabricated within the limits of the skid which is designed to support the process vessels, heat exchangers, and pumps and has an over-all dimension of 8 by 25 ft. Highway limitations set the height of the equipment mountable on the skid at 10 ft. The absorber and still exceed this height and must be shipped separately. Of course, the rich-oil heater, plant storage, power-generating facilities, and cooling tower, if required, are mounted separately because of the space they occupy and the safety requirements of the plant.

Process Description

The description is illustrated diagrammatically in the accompanying flow chart, Fig. 2. Gas is compressed and cooled to approximately 90° F. before it passes into the base of the absorber. The rich oil flows from the base of the absorber into the flash tank where a reduction in pressure permits flashing stripping vapors at approximately 90° F. The flashed rich oil then flows through heat exchangers countercurrent to the hot lean oil, into a direct-fired heater.

Partially vaporized rich oil from the heater enters the midsection of the still, which is a column packed with ceramic rings. The vapor portion of the feed and the vapor stripped from the lower section travel up the column, which is refluxed with the gasoline in order to condense vaporized lean oil.

The oil flows through the lower section of the column to be stripped of gasoline components by the ascending stripping vapors, which come from the flash tank and are heated by exchange to approximately 425° F. with the hot lean oil to insure a maximum stripping temperature in the still.

Vapors from the top of the still are partially condensed in the condensers and pass to the reflux tank. The uncondensed vapors from the reflux tank recycle to compressor suction. Gasoline is removed from the reflux tank by a pump which discharges a controlled portion to the top of the still as reflux and the remainder to the product storage tank from which it is loaded for sale.

The hot lean oil from the base of the still is used to heat the stripping vapors, and to exchange heat with the rich oil before it is sent to the coolers where its temperature is reduced to 90° F. by circulating cooling water. It is then pumped from the surge tank to the absorber.

It should be noted that no steam-generating facilities or instrument air compressors are required in this plant.

TABLE 1 — APPROXIMATE PERFORMANCE AND UTILITY REQUIREMENT

A. Approximate operating conditions

	Psig.	°F.
Absorber inlet	220	90
Lean oil		90
Rich-oil heater outlet		500
Still top		205
Still bottom	40	460
Still reflux tank	35	100
Gas volume M.cu.ft./day containing 2,380 gal./day pentane plus		5,000
Oil circulation g.p.m.-180MW LO		25
Gasoline production 34 lb. R.v.p.		2,450
Residue sales volume M.cu.ft./day		4,930

B. Utility requirements

Power for pumps, Kw.	9.2
Plant lighting, Kw.	3.0
Fuel for heater M.cu.ft./day	39.0
Cooling-tower makeup bbl./day	100
Recycle comp. power, b.hp.	23.4

The instruments are operated on gas pressure, and a direct-fired heater and dry stripping eliminate the need for steam. The cooling load is carried by the small atmospheric cooling tower, which is mounted on a separate foundation some distance away.

Pumping equipment is driven by electric motors; however, if such power is not available, it is practical to install a hydraulic system. The power in such a system can be furnished by a gas engine driving an oil pump which in turn drives hydraulic motors powering the pumps.

Dry Distillation

The use of dry distillation is the principal means of reducing the cost of this plant. This system has been developed during the past few years and has proved to be quite practical, particularly when used in conjunction with a rich-oil heater which increases the temperature of the oil to 500° to 550° F., which is the maximum temperature permissible for an average absorption oil to avoid possible cracking conditions in the rich-oil heater.[2]

Dry distillation may be defined as a process employing hydrocarbon vapors as a stripping medium for absorption oil. The vapors from the cold flash tank are the lowest-molecular-weight vapors obtainable. These vapors are primarily methane and ethane, which is quite desirable from a process point of view, in order to remove the salable hydrocarbons from the lean oil as completely as possible; however, the use of dry distillation brings a mixed blessing. Decision for its use was made after balancing the following advantages and disadvantages:

The advantages of hydrocarbon stripping are:

1. Its use eliminates the investment of a steam plant.

2. The dry distillation system eliminates water from the process which reduces corrosion and minimizes the hazard of freezeups.

3. It eliminates the investment and operating cost of adding dehydrating equipment if the gas has been previously dehydrated before it is brought into the plant.

The disadvantages of hydrocarbon stripping are:

1. It reduces the extractive efficiency of the lean oil, since the lean oil in the base of the still reaches an equilibrium with all components in the stripping medium.

2. It adds an additional vapor load on the condensing section of the still, which increases the reflux needed and makes it more difficult to condense the product.

3. Since the noncondensed vapors

(Continued on page 106)

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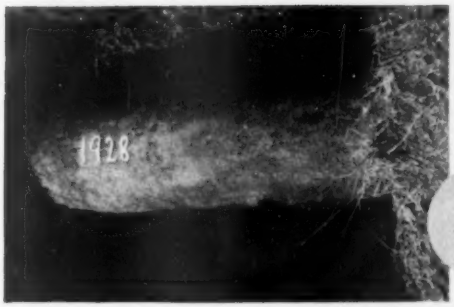

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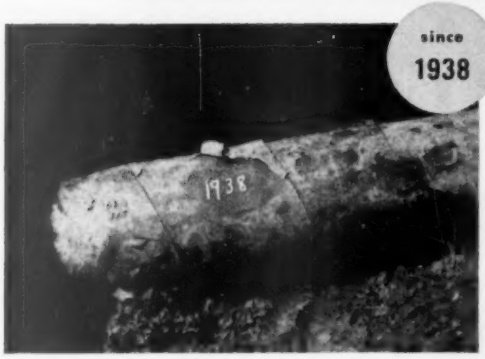

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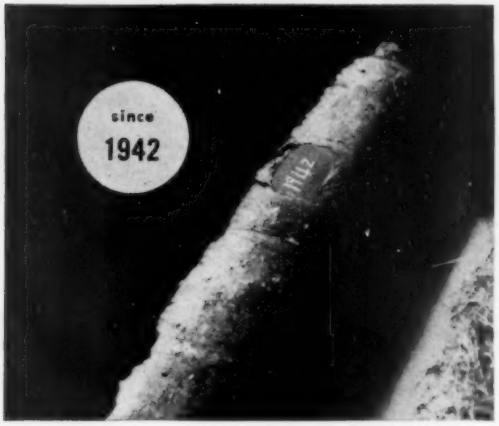

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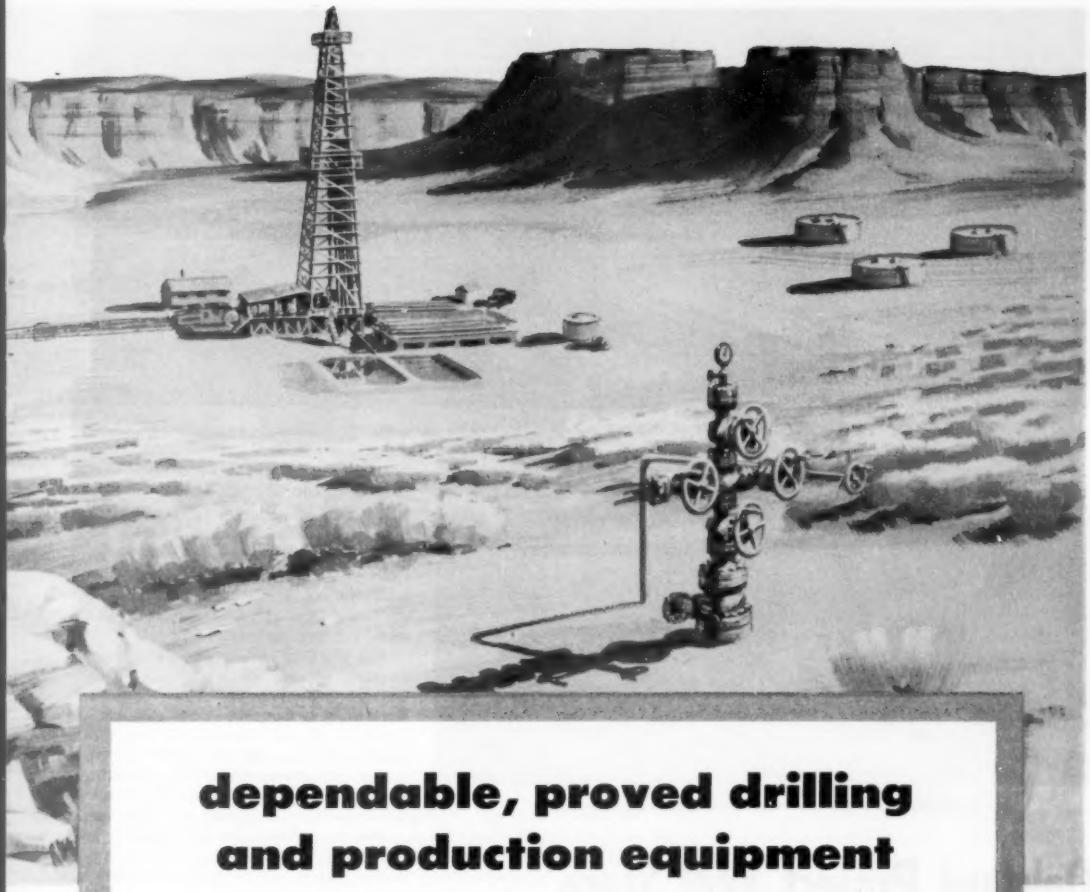

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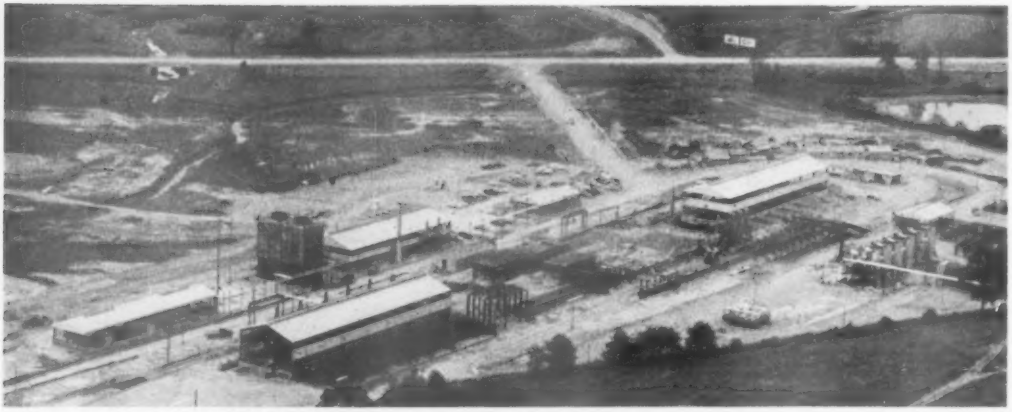
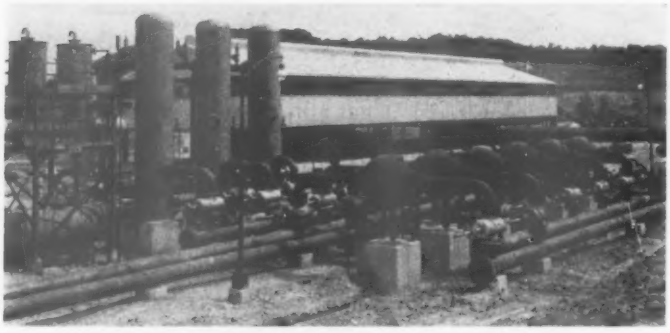


AERIAL VIEW of Oakford storage plant, looking southeast.



SCRUBBERS AND SEPARATORS used in processing storage gas.

Oakford Project Will Store 105 Billion Cubic Feet of Gas

Summer storage of natural gas in underground reservoirs near consumer areas is more economical than construction of additional pipe-line capacity which is not needed during half the year.

by C. B. Brown*

THE rapidly increasing demand for natural gas in the Appalachian and eastern seaboard areas has resulted in the need for large-scale development of additional natural-gas delivery capacity. In order for the industry to meet this expansion in demand, particularly in the domestic space-heating market (with its attendant peak-load requirements), there is required either additional pipe-line capacity preferably operating at high load factor with attendant large interruptible sales or storage of natural gas from existing pipe lines serving the area.

A logical solution of this problem is the use of low-cost natural underground storage of gas from existing pipe lines. This makes available existing gas supplies to the domestic consumers, particularly during winter when large volumes are required.

A series of underground natural-gas reservoirs known as the Oakford storage area located in Westmoreland County, Pennsylvania, were, from the standpoint of location and operational characteristics, found to be ideally situated for this purpose.

The Oakford storage area has been developed jointly by New York State Natural Gas Corp. and Texas Eastern Transmission Corp. to store gas from surplus pipe-line capacity during the summer months and to redeliver such stored gas during the winter months when pipe-line capacities from the Southwest are inadequate to supply requirements. Total storage capacity is 105 billion cubic feet, of which 60 billion may be withdrawn to meet winter-time requirements.

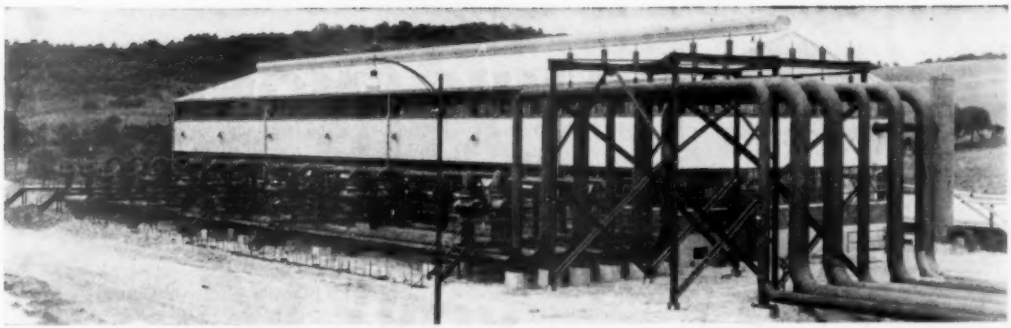
In order to get gas into and out of storage at the required pressures a 30,000-hp. compressor station and a large dehydration plant are installed in the storage area near Jeannette, Pa. Engineering design and construction of these facilities were done by Ford, Bacon & Davis, Inc., of New York City. The plant was put in operation February 11, 1952.

Pressures . . . Gas is received from the pipe lines at 450 psig. When field pressures are lower than this, gas goes directly to storage. Compression is necessary for injection operations when pressures tend to equalize, and compression is continued until maximum pressures are attained.

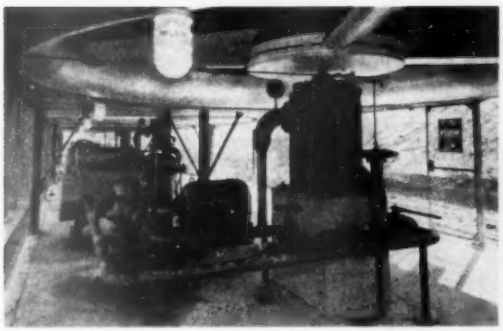
On the withdrawal cycle, gas is delivered to pipe lines at 850 psig. after dehydration. Compression becomes necessary when delivery pressure of 850 psig. cannot be maintained from the storage reservoir.

The storage reservoir comprises two

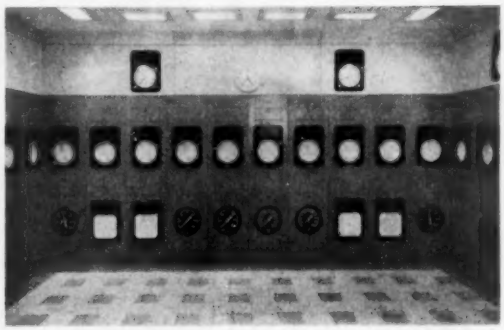
*Consulting mechanical engineer, Ford, Bacon & Davis, Inc., New York.



VALVE-YARD view, suction and discharge piping west of initial compressor building.



FIN-FAN jacket water cooler hydraulic drive unit.



METER AND REGULATOR panels located in control room.

sands extending together about 8 miles northeastward from Jeannette:

1. The upper or Murrysville sand holds about 85 billion cubic feet, of which 52 billion can be withdrawn during winter months.

2. The lower or "Fifth Sand" is denser and will store only 20 billion cubic feet, of which 8 billion is withdrawn. It is held in reserve during each withdrawal period against outage of the compressor station.

Since both sands had been exhausted they will not be fully charged for about 5 years.

Compressor-Station Requirements

The station is designed:

1. To receive gas from either sand or either pipe line and to deliver to any one of the others.

2. To operate on single-stage or two-stage compression.

3. To employ both single and two-stage compression simultaneously as the respective pressures of the sands and pipe lines may require.

Flexibility over a wide pressure-and-capacity range is provided by sizing the piping for the lower pressures and quantities and constructing for the highest pressure conditions.

Piping is arranged so that gas from each sand and pipe line can be handled separately, except at the dehydration plant.

To provide for meeting an emergency withdrawal demand, without using compression, the Fifth Sand will be filled as rapidly as possible in the injection period.

Station gate valves . . . Three field lines and two pipe lines enter the station site along its south boundary line, then turn north and terminate in five gate valves 280 ft. south of a meter station. The station piping commences at that point and connects each of the five valves with its respective meter run group.

These five valves termed "fire gates" must be shut off in an emergency. Each is equipped with a pneumatic operator with a five-way control valve having a spring-opposed electric solenoid.

Each control valve is arranged so that when the solenoid is energized the gate valve will open. When the solenoid is dead, the opposing spring moves the control valve to the opposite position and the gate valve closes. Operation of these gates is by air at 250 psig.

Emergency "close" buttons which cut off the current from all fire-gate solenoids are located at each end of both compressor buildings and in a meter house. Failure of the power supply will also cause the gates to close, so that the auxiliary building crew has only to pull the proper switch to kill all fire-gate circuits, causing them to close and cutting off all gas entering the station.

Meter station . . . Each pipe line and each storage sand is served by its separate group of 12-in. orifice meter runs. The number of 12-in. runs in each group is determined by the expected maximum actual volume, i.e., the maximum flow that will occur at the lower pressures. At pressures above the lowest operating pressure of any group, some runs should be valved off. To aid adjustment to the desired flow, the No. 1 run in each group may be throttled by "inching" with the pushbuttons.

The orifice-meter instruments, pressure and temperature recorders, and pressure gages for each group are mounted upon a U-shaped panel board in the meter and regulator house (See accompanying photograph). Back of this main panel, auxiliary panels mount air actuated equipment for totalizing the flow in each group and indicating that total on a dial mounted on the main panel above the respective group meters. These indicators afford a relatively accurate total flow reading for each group of runs. A valve-control panel

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SETS WITHOUT DIFFICULTY: Two turns to the right releases the automatic clutch for setting. Left hand rotation is NOT required. This clutch re-latches automatically when tubing is raised. All working parts are completely enclosed eliminating fouling from debris or foreign matter and assuring positive setting.

HOLDS PRESSURE WITHOUT FAILING: The packing element requires only small longitudinal compression to pack-off. This results in longer compressed length with minimum distortion. When set with 25,000-lb. tubing load and subjected to 6000-lb. pressure at 300° temperature, exhaustive tests showed no leakage or failure of the heavy duty oil-resistant packing.

PULLS WITHOUT DIFFICULTY: Since all working parts are assembled from within the housing there is no way for them to come out and wedge between the packer and casing. All working surfaces are machined to a smooth finish and the slip-cones are hard chrome plated to protect against corrosion and to prevent slip seizure.

There, briefly, is the story of how this new O-C-T Packer can save you money by eliminating the common causes of packer failures when running, setting, holding, and pulling out. Ask your O-C-T representative or write for details about this new O-C-T Packer.

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behind the operator's chair carries pushbuttons with indicating lights which permit the meter operator to cut out runs or throttle the No. 1 runs to obtain the desired flows.

During summer the flow is into the station from the pipe lines and out of the station to the storage sands. This flow is reversed in the winter months, consequently all meter runs are reversible. This was accomplished by double valving the differential pressure connections at each orifice fitting.

The orifice pressure lines are connected respectively into the high or the low sides of the manometers of their meters and totalizers. At the orifices, each of these pipes connects by valved drops into both flange connections. One or the other, never both, of these cocks from a particular line must be opened. To meter reversed flow, the operator must reverse the cock position at each orifice.

The flow totalizing equipment, which is panel mounted, includes a square-root computer for each meter run. This is essentially a flow meter and takes its differential pressures from the regular meter connections. It also receives a corrective pressure impulse from the "pressure transmitter" for its group. Then it emits an air impulse proportional to the corrected flow in that meter run. These air impulses are added in a series of "Hagen totalizers," the total impulse being delivered to the dial indicator for the group.

Dehydration plant . . . This installation is arranged so that it may be used to dry gas coming from the two pipe lines or gas being delivered to them, or it may be bypassed entirely as conditions require.

Each of the six towers is capable of drying gas at a rate of 100 million cubic feet per day, for a period of 8 hours. Each tower is then dried out for 2 hours and is then cooled for a further period of 2 hours. Hence, every 2 hours a "cold" tower is put into service drying gas, a tower is taken out of service for heating, and a tower is cooled in preparation for the drying period.

The necessary valve operations are normally performed automatically but if the automatic control is inoperative, the operator must initiate each valve movement by means of the pushbuttons on the valve control panel in the control house.

Piping manifold . . . The different operating conditions that occur require cross connections that would be very involved if the manifold were constructed in the usual single-plane, side-by-side header arrangement. Therefore, advantage has been taken of the hillside slope to arrange the manifold in two horizontal planes with the line headers running east and west above; the discharge and suction headers beneath, running north and south and with vertical valved connections where needed.

The valves in all these vertical connections are air motor operated and controlled from the meter house, at the same control panel as the first gates, the meter runs and the dehydration headers.

With this type of manifold, each line header can be connected into either discharge header or either suction header by opening the valve at their crossing point.

Gas-pressure-reducing station . . . At the start of each withdrawal period, when field pressures are high, it is necessary to reduce pressure before dehydration and delivery to the pipe lines. To prevent cooling to a hydrate-forming temperature, the high-pressure gas is preheated before pressure is reduced.

Suction scrubbers . . . These are placed in a break in the suction headers, so that they may not be bypassed under any circumstances. Space is provided for an extra scrubber if it be found necessary.

Each scrubber vessel is filled with No. 2 diesel oil. At low gas velocities, most of the oil drops out in a disengaging space, flowing back into the oil chamber below. At high gas velocities oil carried above the disengaging space is removed by a mist extractor in the top of the scrubber. (See accompanying photograph.)

Compressor station headers . . . Two systems of station headers are provided and space is left for a third system. Each system consists of a sectionalized suction header, a sectionalized hot gas header and a discharge header, which permit these operations:

1. Gas from two sources can be separately compressed, either single stage or two stage, to different discharge pressures or to the same discharge pressure.

2. Gas from one source can be compressed to equal the pressure of gas from another source and the two combined can be compressed to a higher pressure.

Compressor connections . . . Because of the constantly varying operating conditions, all compressors are connected for use on either header system, hence all are connected to both main suction headers and to both main hot gas headers. The compressor connection valves are mounted on panels in the compressor building at the sidewalls, opposite each respective unit. Flags on the valve operator, indicating the position of each valve, are visible through the windows at the control valve panels (see accompanying photograph).

Discharge separators . . . To prevent condensate from the compressed gas from adding to the dehydration plant load and upsetting the schedule, all compressed gas is passed through separators located in a break in the discharge headers so that they cannot be bypassed. This also prevents any oil picked up in the compressor cylinders from contaminating the adsorbent.

The six separators are spherical type good for 1,500 psig. working pressure and are designed to pass 80 million cubic feet per day each at 450 psig. with a pressure differential less than 6 in. of water. This low differential is essential to the proper performance and additional units must be used if more than 80 million cubic feet per day at 450 psig. per unit is being passed.

Engine compressor units . . . These are Cooper-Bessemer Co.'s 10-cylinder, GMW, 2-cycle, V-angle arrangement units, each rated 2,400 hp. at 250 r.p.m., or 2,500 hp. at 261 r.p.m. Each is equipped with three compressor cylinders, except that Unit No. 1 has five for better loading during the early stages of repressuring. Engine power cylinders are 18 by 20 in.; compressor cylinders on Units Nos. 1 to 5 inclusive are 13¾ by 20 in., with suction valve lifters for unloading at low pressures. Units Nos. 6 to 12 inclusive are 14 by 20 in. with suction valve lifters.

Gas coolers . . . Five Fluor Fin-Fan heat-exchanger cells are provided for cooling the compressed gas. Each cell has four Griscom-Russell fin-tube coils for 1,500 psig. working pressure.

Beneath the four coils of each cell is a single fan. Each of the five fans is of propeller type on a vertical shaft with step bearing and gear unit which is direct connected to a 50-hp. Crocker Wheeler, 1,800 r.p.m. explosionproof motor.

Jacket water coolers . . . Four Fluor Fin-Fan heat-exchanger cells are provided for cooling the engine-jacket water. Each cell has five Griscom-Russell fin-tube coils, good for 125 psig. working pressure.

The five coils of each cell are equipped with a single propeller-type fan. Each of the four fans is driven by a Rockwell Rotocycle hydraulic motor, with Rotocycle pump and 60-hp. electric motor. (See accompanying photograph.)

Control of fan speed to maintain the desired "off-coil" jacket water temperature is accomplished by a 2-in. Fisher

No. 555T regulating valve, air loaded by a Bristol No. IT500K, Class 1, temperature controller. Both the hydraulic pump and motor are of positive-displacement type so that whatever oil is delivered by the pump must flow through the motor. Full speed of the fan is obtained when full pump output passes through the motor.

If any of the pump output is allowed to bypass the motor, the fan speed is reduced in direct proportion to the amount bypassed. Therefore, the Fisher regulator is installed in a bypass across the hydraulic motor connections. Then as jacket-water temperature off the coil drops lower, the air loading pressure is increased and the regulator opens, allowing oil to bypass and slowing down the fan.

Jacket water . . . The system is designed to circulate 960 g.p.m. per compressor unit and 430 g.p.m. per power generating unit.

Lube-oil water-cooling tower . . . Water for oil cooling and other miscellaneous cooling purposes must be at all times below or at most 115° F. and such water is cooled in a tower, where the limiting condition is a 75° wet bulb temperature, rather than a 100° dry bulb temperature.

Lube-oil cooling . . . Water for this purpose is circulated in a closed system having as its high points the overflow levels in two lube-oil water surge tanks at the two compressor buildings and with the two circulating pumps located at the low point of the system. Suction and discharge headers to these pumps are installed as continuation of the jacket-water system, so that by use of the sectionalizing valves in these headers, the spare jacket water pump can be used in place of the two lube-oil cooling-water pumps, should both be needed when one is out of commission.

Starting air . . . Four Gardner-Denver air compressors are used for this purpose. These units have a free air capacity of 74 cu. ft. per minute each when running at 870 r.p.m. and discharging against 250 psig. All are V-belt driven, one by a Continental gas engine. The others are driven by 30-hp., 1,800 r.p.m. squirrel-cage motors.

Heating plant . . . Two Babcock & Wilcox integral furnace boilers, with Todd gas burners supply steam for the station operations. These boilers are equipped with automatic control, flame-failure and low water protection, forced-draft fan, safety valves, water columns, feed-water regulator, and Magnetrol control of feed-water pump.

Each boiler has a peak capacity at 100-psig. pressure of 14,100 lb. per hour. Normal operation will be at 30 to 35 psig., at which pressure the peak capacity is about 8,850 lb. per hour.

Power plant . . . All power for the compressor station related operations is produced by three gas-engine-driven alternators.

Each of these three generating units is 1,445-hp. Worthington 6-cylinder, 360-r.p.m. gas engines with direct-connected 1,000-kw. Electric - Machinery Co. generators.

Portable Gasoline Plants Gain in Popularity

(Continued from page 98)

are recycled back to the compressor, its use adds to the compressor horsepower requirements.

Control System

The control system has been designed for fully automatic operation and controls carefully selected for simple operation and maintenance. The operating controls are not shown on the flow chart and are conventional. The only special features are the safety devices and an uncomplicated type of temperature control, which bypasses sufficient vapors around the still condensers to maintain a controlled temperature on the reflux tanks.

Since the pressure on this tank is set, controlling temperature permits operating the plant so as to produce a given grade of gasoline with certain limits. A temperature control on the top of the still regulates the reflux to hold the end-point specification on the finished gasoline.

Safety features . . . The key to safe operation of this type of packaged plant is an automatic safety shut-down system described in flow diagram, Fig. 3. The system incorporated performs the following functions:

1. With low pressure of 15 psig. or less on the heater outlet, fuel gas to the heater burner is cut off and rich oil from the absorber is stopped.

2. If the stack temperature reaches 1,250° F., the fuel gas is cut off and rich oil continues to flow.

3. Flame failure at the burner cuts off the fuel gas and the rich oil continues to flow.

4. Power failure permits the continued flow of rich oil and cuts off the fuel gas.

The safety system is actuated by electrical power which trips the proper solenoid. When any emergency occurs, the system will "fail safe," i.e., with either the loss of electricity or instrument gas, all valves will be open or closed, whichever is desirable for the safety of the plant and personnel. On any of these failures, an electrically operated solenoid valve causes a horn to sound to warn the operator. After the fault is corrected, the entire system must be manually reset before operation can begin again.

Experience has shown that in an emergency or through misoperation, the simple safety system outlined herein will protect the heater which is the principal source of danger in one of these plants.

L.P.G. manufacture . . . The stock plant can be modified to produce a butane-propane mix. The accompanying flow diagram, Fig. 4, shows an economical means of manufacturing L.P.G. and grade gasoline in a single column. Liquid product is taken from the discharge of the still reflux pump and fed to the stabilizer, at one of three alternate points. Vapors from the still reflux tank operating at 50 psig. are compressed and discharged while still hot directly into the column at 275 psig.

The L.P.G. is taken as a side stream from the column at one of three alternate withdrawal points. The vapor pressure of the L.P.G. product is determined by point of withdrawal, reflux ratio, and the temperature of the reflux tank which is controlled by bypassing overhead vapors around the stabilizer reflux condensers.

The reflux system is set up for dew-point operation and all the liquid formed in the reflux condenser is pumped back down the column. The base of the column is controlled in a conventional manner with a temperature control which sets the quality of the grade gasoline produced.

This operation results in a stabilized gasoline and a partially stabilized butane-propane mix as a side stream product. The heat required for the reboiler is furnished by the hot lean oil from the base of the still. This duty is minimized by introducing part of the feed into the column as a hot vapor.

References

1. Output of Field Processing Plants Nears 10 Per Cent of Crude Production, by John C. Casper, The Oil and Gas Journal, Vol. 50, No. 52, 1952, pp. 214-216.

2. Absorption and Dry Distillation, R. L. Lane and B. J. Thompson. Presented thirty-first annual convention, N.G.A.A., Rice Hotel, Houston, May 1, 1952.

Rig. No. 3 of Santa Fe Drilling Co. on the Triangle Ranch island at Sansinena. At the first of September the rig was on the nineteenth of 25 wells to be drilled from the island.

Stay-at-Home Rig

by D. H. Stormont
West Coast District Editor

CREWS on Santa Fe Drilling Co.'s rig No. 3 are beginning to feel at home in the La Habra Heights area on the eastern outskirts of Los Angeles. The rig has been there for the past 3½ years and probably will be there this Christmas.

On February 19, 1949, the rig spudded No. 18 Sansinena for Union Oil Co. After drilling 12 wells and redrilling another from this multiple-well location, the rig was moved about 2,000 ft. to a second island where seven wells were completed. In March 1951 it was moved about 1 mile east of the second island to its present site, the Triangle Ranch location. There by late August it had completed 18 producers.

Since moving onto the first well the rig thus has drilled 38 wells to an average depth of 5,000 ft. Actual total footage drilled was 191,555 ft. By the time it completes the last of the 25 wells planned for Triangle Ranch, almost 4 years will have elapsed. Its drilled footage then will approximate 230,000 ft., about 20 times the distance the rig will have moved in accomplishing the drilling.

This unusual record of permanency for a contract rig fits in well with the long interval over which the Sansinena field has been developed. Union secured the mineral and drilling rights to the 2,000-acre tract back in 1904. After sporadic attempts to develop oil, during which 15 dry holes or marginal producers were drilled, good production was found in 1945. Between then and the first of 1949, however, only one other well was drilled.

During 1949, 1950, and most of 1951, development proceeded on a one-rig basis. Entry of other operators on the south flank late last year caused Union to step up the pace; a second Santa Fe rig was put to work in that area. This rig in late August was on the third of what will be a 10-well island. At that time Union's production from the 44 wells then completed was slightly over 5,000 bbl. daily.

All slant-hole drilling . . . None of the 38 wells drilled by Rig No. 3 are straight holes. Completed in one of three Miocene sands encountered at vertical depths of 2,800 to 4,500 ft., all wells are bottomed some distance from the drill sites. Largest horizontal displacement of any well is about 1,600 ft. Greatest drilled depth is 6,130 ft. and the highest deviation attained in any well is about 60°.

In most cases it was necessary to set a whipstock only when deviating from the vertical hole. Average number of whipstocks has been 1.3 per well. Once the hole is started toward its target, directional control is obtained by taking readings with a single-shot instrument at about 20-ft. intervals. The drillers, two of whom have been on all 38 wells, and the third was on 22 wells, have become so expert at slant-hole drilling that little difficulty is had in keeping the hole on-target.

Despite all drilling having been directional, no fishing jobs have been encountered because of this practice. Dropped tools and equipment caused three major jobs, with the fish being recovered on the first run in each case.

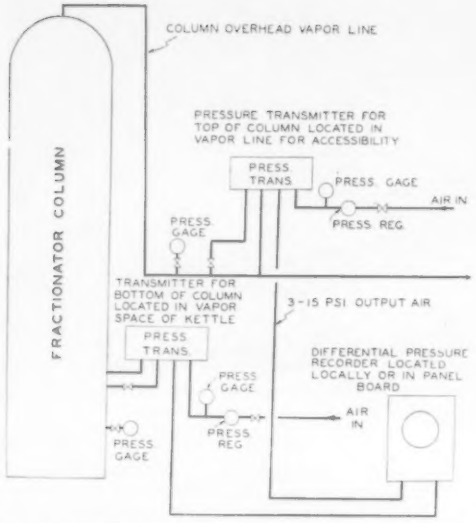
Key seating resulted in drill pipe becoming stuck twice. In each case the string was backed off and the fish recovered. Through careful attention to hole conditions, and reaming of sections where the pipe tended to bind, the past 17 wells have been drilled without any sticking.

Average over-all time on most wells was 18 days. Fastest time was 10 days, on an upper-sand well with little deviation. Average time for skidding from well to well has been about 10 hours. On a recent well, however, the move was started at 8 a.m. and by the time tour was changed at 3:30 p.m. the crew was all rigged up and had drilled 50 ft. of surface hole.

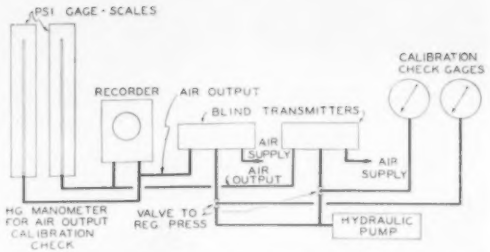
Drilling soundproofed . . . Because the activity is surrounded by homes, narrow, steep-sided ravines were chosen as the site for the multiple-well locations. To further muffle the drilling noises, the derrick and engine house are completely shrouded in a glass-wool-filled canvas envelope. Little of the drilling activity can be heard at a distance of only 50 ft. from the derrick.

P. J. Thayer, tool pusher for Santa Fe, has been on the Sansinena development from the beginning, supervising the drilling and planning work so that the rig was kept busy drilling 24 hours a day. No small part of his job during the first wells was in keeping peace with nearby residents. This, however, is no longer much of a problem.

If and when Rig No. 3 is moved from Sansinena, Santa Fe officials are wondering if Thayer will be able to drill a straight hole. The story is that he recently was called upon to supervise a nearby well in the absence of the regular pusher. After only a few hundred feet of hole was drilled, according to the story, hole was found to be off 7°.



SCHEMATIC DIAGRAM of force-balance type transmitter installation. Fig. 1.



TEST BENCH HOOKUP for calibration of pressure transmitters and receiver. Fig. 2.

Force Balance Pressure Transmitters Used to Detect Column Flooding

by Gordon W. Swinney*

THE last decade has seen rapid development in the processing and the use of hydrocarbons derived from natural gasoline. These hydrocarbons are used as such for fuel (propane and butane), as feed stocks for various types of petrochemical plants manufacturing special products, as well as in synthetic compounds and plastics.

The growth of this petrochemical industry has brought about process steps —suitably termed superfractionation. These fractionators make an extremely close and accurate separation of hydrocarbons to a percentage of high purity. Also, these fractionators are designed to operate at high capacities and high efficiencies and often with separation in a narrow temperature range.

Control systems used and techniques of operation of such fractionating columns have been improved a great deal over those required to operate the simpler type absorption tower. It is hard to conceive of the modern fractionation unit operating without the present-day control systems.

These systems measure and control (1) external functioning of the column —such as feed, reflux, kettle product, overhead vapors, and steam for heating elements; and (2) internal conditions of the column such as temperatures, liquid level, pressure, and product composition. Automatic measurement and control of composition is relatively new.

Column pressure drop measurement provides the operator with a valuable tool for improved column operation. The idea of measuring the column pressure drop is not new. Measurement of this function of column operation has been attempted with various types of instruments with little success.

The development of the force-balance narrow span type pressure transmitter has provided an instrument through which column pressure drop measurement has become a practical reality.

With all of these control systems effective there is still lacking a means of anticipating the flooding of the column which, in many cases, prevents safe operation at maximum load for greatest economy.

Therefore, any improvement in operation which can be brought about through the use of improved measurement and control equipment, with resultant increased production, is always welcomed. The force - balanced type pressure transmitter to measure the pressure drop across the trays of a fractionating column is one means recently used.

Requirements of the Pressure-Drop Measurement Instrument

Requirements of an instrument to be used for measuring pressure drop across a column involve a consideration of that which creates this pressure drop. Basically, this pressure drop is the sum of the very small increments of pressure loss across each bubble tray. The magnitude of pressure drop across each tray results from liquid height and the counterflow conditions of the two component phases.

Therefore, any instrument to be used for column pressure drop measurement must effectively, under all conditions of operation, measure accurately small values of pressure within the over-all operating range of the column.

Attempts have been made in the past to measure column pressure drop, but the results were usually unsatisfactory because the equipment available did not meet the necessary requirements. These requirements may be discussed in the following three groups:

1. Range span.
2. Sensitivity and accuracy.
3. Adaptability.

*Phillips Petroleum Co., Phillips, Tex. Presented at Cleveland meeting, Instrument Society of America, September 8-12, 1952.

Range span . . . The range span of the instrument is an important factor, since the pressure drop to be measured is usually within a span of 0 to 20 psig., with the normal pressure drop being 10 to 15 psig. This pressure is measured at the operating pressure of the column which may be any value from 10 to 1,000 psig. or more.

An instrument capable of measuring the over-all operating pressure of the column from start-up to operating conditions, provides a very narrow span for measurement of the small increments of pressure change required to detect variations in over-all pressure drop. Therefore, the instrument to be used for pressure-drop measurement should be capable of measuring a narrow pressure span within the over-all pressure variations of column operation.

Sensitivity and accuracy . . . High sensitivity and accuracy of the instrument for pressure drop measurement are musts. The purpose and intrinsic value of this instrument is to detect very small pressure changes resulting from varying conditions on the column trays. The instrument must be able to detect these small changes and accurately indicate or record them.

Adaptability . . . As with any instrument the adaptability to use any installation is an important factor in considering its application to a particular service. The instrument to be used for pressure-drop measurement should be such that it can be installed for year-round service with a minimum of protective equipment and cost. Also, it should be such that it is not affected by extraneous forces which would result in false measurements.

Comparision of Various Types of Pressure Measuring Instruments

For a clearer understanding, a comparison of the various types of instruments that might be used for pressure drop measurement in terms of requirements should be made. For purpose of comparison, the various instruments that might be used for pressure drop measurement can be considered in three general categories, namely:

1. Differential instruments — mercury and others.
2. Spring-type pressure instruments.
3. Force-balance-type pressure instruments.

With the basic requirements for a pressure-drop measuring instrument in mind (as discussed above) consider the application of these three types of instruments.

Differential instruments . . . Since it is a differential pressure that is to be measured, it would seem most obvious that a differential instrument would be readily applicable—either the mercury U-tube or the newer mercuryless diaphragm or bellows type.

The mercury U-tube is found to be unsatisfactory for any differential pressure range beyond approximately 7 psig., as the range tube becomes excessive in length and cumbersome to handle the ordinary instrument range of 0-20 psig. Such an instrument would require a range tube some 5 ft. long. Of course this can be done, but is impractical in most cases.

The mercuryless differential-type instruments in the form of transmitters overcome the objection of range adjustability of the mercury U-tube. Their drawback, which holds for the mercury U-tube, is in the adaptability of installation.

The use of such a differential pressure instrument would require long gage lines which present the problem of excessive cost of installation for year-round operation. Also, they are subject to extraneous forces such as unequal liquid legs which result in inaccurate measurements.

Spring-pressure instruments . . . The second type of instrument to be considered is the spring-pressure measuring instrument. These instruments are made with a range of zero to some higher pressure such as 50, 100, or 200 psig. The pressure-drop measurement covers a 0-20-psig. span at the operating pressure of the tower which falls within the over-all range of the instrument.

Such an instrument falls far short in the requirement of sensitivity and accuracy under operating pressure above 50 psig. since the measurement is made over 20 per cent or less of the scale range.

In applications where the operating pressure of the tower is 50 psig. or less, the spring-type instrument can be used satisfactorily since it is readily adaptable to an installation providing necessary protection as required by climatic conditions for year-round operation. Also, the instrument can be mounted at the pressure point for elimination of liquid legs.

Force-balance pressure transmitter . . . The third type of instrument, the force-balance pressure transmitter, will now be considered. The first requirement was range-span adaptability. The force-balance pressure transmitter is so constructed that it measures a narrow span of 0-20 or 0-40 psig. within various larger range limits. This type instrument permits measurement of a narrow span of the pressure within the over-all range of the instrument and can be readily changed within these over-all limits.

The force-balance pressure transmitter lends itself favorably to the second requirement of sensitivity and accuracy. The narrow span of measurement over the full air output range of the instrument provides sensitive and accurate measurement and reading of pressure changes of one-half psig. The force-balance-type instrument, due to its principle of operation, insures detection of any small pressure changes.

Finally the force-balance pressure transmitter is very adaptable to easy installation. The instrument, being of the blind type, is a small and compact unit and requires no additional housing. The pressure-point connection is small and of a type that is not subject to freezeups, thereby eliminating additional installation costs to provide protection for winter time operation.

Use of Force-Balance Type Transmitters

The range of the transmitter to be used should be as narrow as possible to provide greater sensitivity and still provide measurement of the maximum pressure drop. A range span of 0-20 psig. is satisfactory for most normal operations. This range span should then be within a range limit, which would provide maximum flexibility of span chiefly to take care of possible column operating pressure changes.

The receiver which records or indicates the pressure drop is equipped with a differential pressure bellows. This bellows receives the 3 to 15-psi. transmitted air of the two transmitters. Using the proper chart to match the range span of the transmitters the instrument records the actual pressure drop. A point well worth noticing is that the two transmitters must be of the same range span since the bellows in the receiver measures the difference in output air from the transmitters which is 3 to 15 psi. for all range spans.

The installation of the transmitters is schematically shown in Fig. 1. The two transmitters are mounted adjacent their respective pressure points with air supply lines and transmitted air lines to the receiver. Since the transmitter is blind and totally enclosed in a weatherproof case, no external housing is required. The receiver can be mounted in any desired location such as a panel board or in the operating area.

Before installation, the pressure transmitters and the receiver should be checked for calibration as an operating unit. This can be done by applying a dead weighted pressure to each transmitter and noting the resultant pressure drop on the receiver recorder, making final adjustments for the ac-

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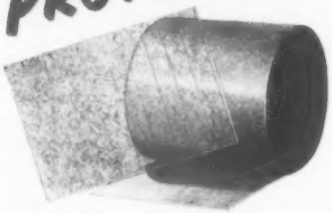

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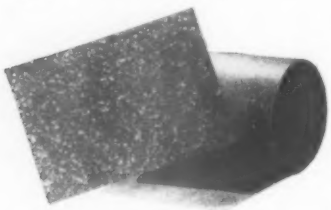

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curacy desired. A schematic diagram of such a test bench hookup is shown in Fig. 2.

Conclusion

From the comparative evaluation of the various types of instruments and the requirements, it can be stated that the differential and pressure spring types fall short of meeting all of the requirements. Their use for pressure drop measurement is limited to a few special cases. However, the narrow span force-balance pressure transmitter with proper installation can be used to measure accurately the slightest pressure drop changes within the column.

The use of the force-balance pressure transmitters has provided the first successful means of measuring and recording column pressure drop continuously and accurately. This pressure drop change indicates immediately to the operator a change in the internal condition of the column. A gradual increase in the pressure drop means the column is approaching the flood stage and operating conditions should be changed accordingly.

The application of these instruments for this service is indeed an example of an improved measurement and control system providing the operator with a valuable tool for better operations, resulting in greater production.

Possible further use of the force-balance pressure transmitter system measuring pressure drop across a column provides a fruitful field for experimentation in its application toward automatic control. Consideration should be given to their role in policing other control systems on the external or internal functions of the tower.

Another possible use of these instruments is in the field of compiling engineering data regarding the actual operation of a fractionation column as compared to the design calculations. Perhaps they will provide information from which improved column design can be obtained.

The writer feels that there are many possible advantages to be gained through the use of these instruments for column pressure drop measurement, and it will be interesting to see what developments take place through their further use.

BOOK

CHEMICAL INVESTMENTS. By John F. Bohmfalk, Jr. Published by Chemonomics, Inc., 400 Madison Avenue, New York 17. 93 pp. $5.

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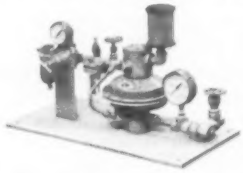
216-C-200	200:1	20,000 PSI.	$225.00
216-C-300	300:1	30,000 PSI.	$289.50



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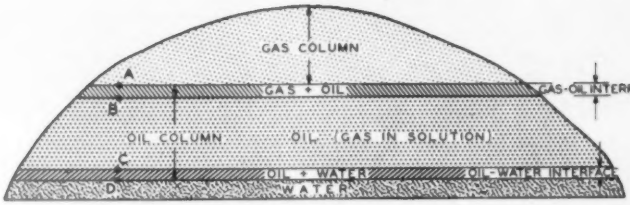

Fig. 1—Schematic diagram defining gas-oil and oil-water interfaces.

A. Lowest point at which free gas produced at well head originally.
B. Highest point at which oil was produced at well head under essentially original gas-oil ratios.
C. Lowest point at which pipe-line oil was produced at well head originally.
D. Highest point at which 100 per cent water saturation was tested or logged originally.

WELL COMPLETIONS

1—How to Find the Oil-Water Contact in a Reservoir

by Joseph A. Kornfeld
Mid-Continent District Editor

IMPORTANT data in the evaluation of an oil or gas reservoir, are the original gas-oil and oil-water interfaces. These are described as the respective subsea depth at which the interface in question occurs with reference to a datum plane, usually taken at sea level.

Definitions . . . The gas-oil interface may be defined as the range of subsea depths which marks the boundary between 100 per cent free gas and 100 per cent solution gas; the base of this transition zone is the highest point at which oil was produced at the well head under essentially original gas-oil ratios.

The oil-water interface is defined as the range of subsea depths which marks the boundary between the lowest point at which pipe-line oil was produced at the well head originally and the highest point at which 100 per cent water saturation was tested or logged originally.

Nature of interface . . . In sandstone media which exhibit high permeabilities and a high degree of sorting, the oil-water interface may be isolated to a single foot such as in the Parker sand in La Grande oil field of Adams County, Mississippi. On the other hand, where the lithology of the sandstone is erratic and sorting is poor, the oil-water interface occupies a wide transition zone. Similarly, the effect of lithology on the character of the distribution of hydrocarbons in a reservoir applies to the isolation of the gas-oil interface.

The oil-water interface is not always horizontal due to magnitude and position of aquifer as well as sorting of the sandstone media.

Where Accuracy Is Important

A high degree of accuracy in the determination of these contacts is required where thin oil columns are found, usually under the following conditions:

1. Low-lying structures, such as the Dakota-Graneros series of the Denver-Julesburg basin; the Wilcox (Eocene) of southwestern Mississippi, and the like.
2. Sandstones intercalated with shale resulting in small sandstone-shale ratios, such as the Yegua-Cockfield formation of the Gulf Coast. The occurrence of paper-thin shale breaks in these sands makes determination of the oil-water interface a difficult problem.
3. Predominantly gas-cap reservoirs with thin residual oil columns, such as Katy field, Waller County, Texas, producing from the Yegua-Cockfield formation; Jackson sand lenses, Jim Hogg County, Texas.

Application of Data

Under the conditions cited above, the necessity for accurate determination of gas-oil and oil-water interfaces is significant for the following applications:

1. Construction of net pay isopachous contour maps. In the case of La Grange field a change of 1 ft. in the oil-water interface subsea depth resulted in a significant change in the areal extent of this reservoir. See Fig. 2.
2. Validity of oil reserve estimates is dependent upon Item 1 above.
3. Choice of completion methods; for thin-column Dakota-Graneros struc-

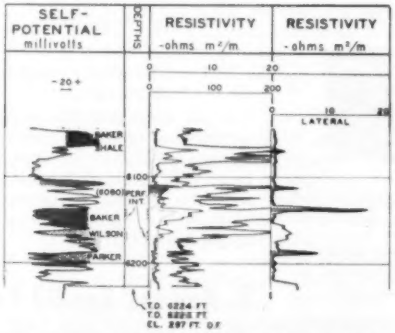

Fig. 2—Electric log of pay section detail in series of thin-column Wilcox (Eocene) sandstone oil reservoirs in South Mississippi; each reservoir has its own oil-water contact.

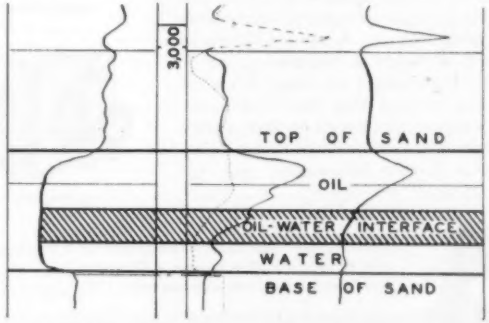

Fig. 3—Resistivity gradient method for isolation of oil-water interface. Case history of a Pennsylvanian sandstone in eastern Oklahoma. (R_m = 1.4 ohms at 108° F.; d = 7⅞ in.)

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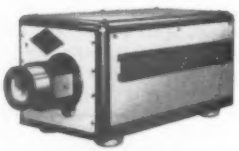

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tures in the Denver-Julesburg basin, perforating the middle foot between the two interfaces in a 14-ft. oil column brought satisfactory well performance. *(See The Oil and Gas Journal, September 20, 1951, pp. 238-239).*

Oil-Water Interface

The following summarizes various methods which may be employed in determination of the oil-water interface:

A. Production tests:

1. The oil-water interface is the interval between the lowest subsea point at which pipe-line oil is produced in the reservoir and the highest point at which 100 per cent water saturation is tested or logged.

2. A rapid increase in water cut after completion may indicate that an oil-water interface has been penetrated. On the other hand it might be interpreted as the effect of high oil rates on coning of the original oil-water interface.

3. In rotary drilling, the drill-stem-test method with overlapping depth test intervals may be used to isolate the oil-water interface. (In cable-tool drilling, the analogous method employed in pay penetration is to drill into the pay a few feet, pull tools, and run bailer to check for bottom water and repeating the method as long as no substantial water cut is found.)

4. Results of cement squeeze jobs to plug off bottom-hole water can be used to isolate the oil-water interface.

B. Core examination:

1. On the derrick floor, detailed examination of the cored oil column may be used to determine the oil-water interface.

2. In the laboratory, the oil-water interface can be determined from a study of core analyses by noting where a sharp increase occurs in water saturation accompanied by a sharp decrease in oil saturation.

C. Electric logs:

1. Use of resistivity gradient method of Tixier. (See Fig. 3.)

2. An increase in the magnitude of spontaneous potential curve may indicate approach of the oil-water interface. This change is related to the resistivity of the formation and is affected by the presence of shale within the formation.

2: And the Gas-Oil Contact

THE oil-water interface divides two dissimilar liquids of different physical properties while the gas-oil interface marks the phase boundary of a

MILESTONES IN CAMERON PROGRESS

Old Davenport was no loveseat

It was a bad break for the operator when Davenport No. 1 blew out and cratered. This well in the La Blanca Field of South Texas was blowing an estimated 100 million cubic feet of gas and oil daily over the countryside. That was in 1938.

The Cameron Pressure Operated Gate Valve had been perfected as a drilling master valve to prevent blowouts, but it was also destined to become equally valuable for another service . . . as a capping valve for wild wells. Its first assignment as such was on the Davenport well, where it took the full volume of high pressure flow for *four days* while the capping manifold was being tied down. Then, although its seat was substantially sand cut by the well flow, the Cameron Pressure-Operated Gate Valve closed and sealed tightly. Scores of wild wells have since been tamed with this remarkable valve.

Today, the world over, oil men look to Cameron for the ultimate in protection against unruly well pressures.

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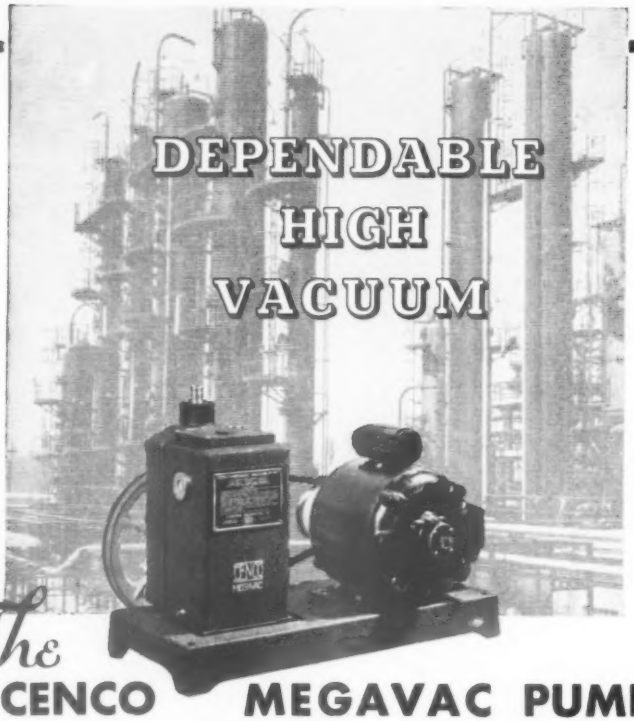

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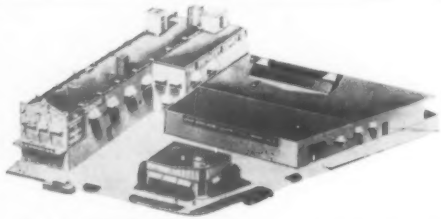

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hydrocarbon mixture. Hence methods applicable to the determination of one contact may not necessarily be applicable to the determination of the other.

The oil-water interface is generally the easier of the two contacts to determine, other factors being equal. On the one hand, the gas-oil interface presents difficulties in isolation, dependent upon where sampling and measurement takes place, i.e., bottom-hole or surface.

Surface sampling . . . Where the effluent is sampled and measured at the surface, the produced gas-oil ratio is important in defining whether the completion is a gas or an oil well. One individual may term a well producing at the rate of 10,000 cu. ft. per bbl. an oil well, while another may call it a gas well. In some cases, a regulatory body may classify as a gas well a completion having a certain minimum produced gas-oil ratio.

Aside from the human equation, vaporization or change in composition that takes place in the well bore (from reservoir to well head) must be considered as well as the effect of bottom-hole chokes and other well equipment.

Rock structure . . . The lithology of the reservoir plays an important part in distribution of reservoir hydrocarbon contents. The most uniform distribution occurs in a highly permeable, homogeneous sandstone. The other extreme may be found in intergranular dolomites such as the San Andres of the Permian basin. Lensing in dolomites or in sandstones may isolate zones that would not be in equilibrium with the major part of the reservoir. This condition would also affect the original position of the oil-water contact.

Methods: Field, Laboratory

The following summarizes various methods which may be employed in the determination of the gas-oil interface.

A. Drilling Tests.

1. In cable-tool drilling, the gas-oil interface is the first level where oil saturation is logged in the base of the gas column.

2. In rotary drilling, the drill-stem-test method employing overlapping depth test intervals may be used to isolate the gas-oil interface. However, this method has its limitations in the case of thin oil columns, i.e., the "D" sand of the Dakota-Graneros (Cretaceous) series in the Denver-Julesburg basin.

3. The side-wall sampling tool may be employed to verify oil saturations at the base of a gas column, a condition suggested from the electric-log survey.

B. Production Tests.

1. A marked change in the color of distillate in the well's separator may indicate coning at the gas-oil interface or rise of the oil column into the gas cap.

2. Failure of successive remedial jobs to reduce a gas-oil ratio of an oil well may indicate that, under certain conditions, an oil-gas interface has been penetrated. One company conducted a series of workovers on a well in an oil field in Jim Hogg County, Texas, producing from the Jackson (Eocene) sand. Operators were unable to lower the gas-oil ratio below 10,000 cu. ft. per bbl. Subsequent operations proved that the well had entered a gas-oil contact. Close attention to operating details of a completion as this may furnish the clue to a gas cap that otherwise would be buried in a routine workover report.

C. Core Examination.

1. On the derrick floor, the gas-oil interface can be picked by noting the first oil saturation at the base of the gas column.

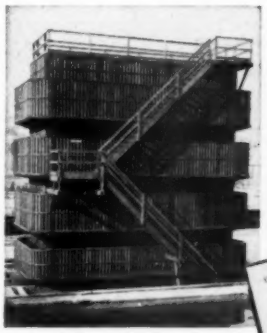
2. In the laboratory, the gas-oil interface can be determined by saturation tests; a sharp increase in the oil-saturation test data at the base of the gas column marks the interface.

D. Gas-Oil-Ratio Contour Maps.

1. In reservoir studies, the existence

(Continued on page 117)

cooling towers last twice as long with Fluor periodic inspections



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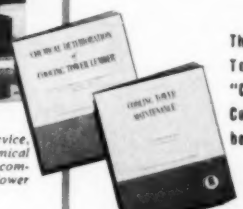

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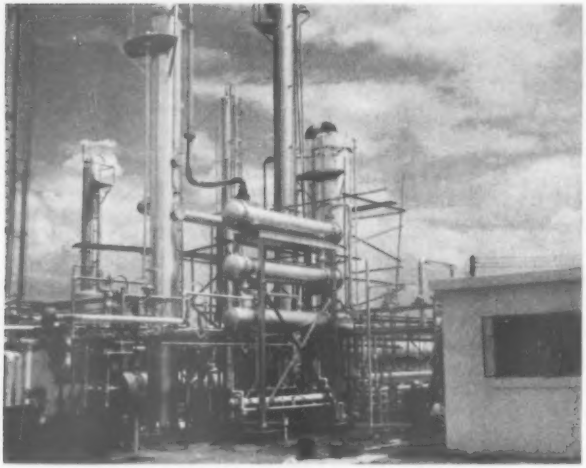
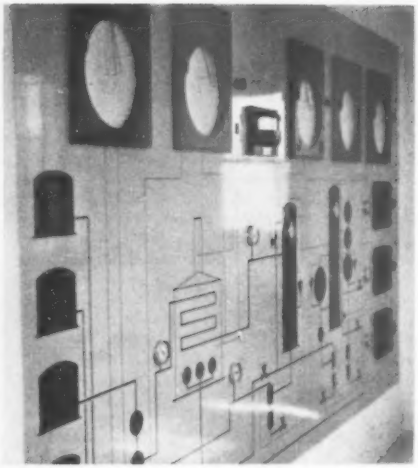


FLASH TOWER, rerun unit, control house, and other processing equipment are seen in this view of the new skimming plant.



CONTROL ROOM has centralized instruments as well as flow-control board showing complete process flow.

Duval's New Skimming Plant Now in Full Operation

Existing rerun tower, new flash tower, and new crude-oil heater have been utilized to bring Benavides plant crude charge up to 16,000 bbl. per month.

by F. Lawrence Resen
Gulf Coast District Editor

A 16,000 bbl. per month skimming plant has completed its shakedown period and is now in full operation at Duval Gasoline Co.'s Benavides plant in South Texas.

The new unit, which was designed under the supervision of the parent Republic Oil & Refining Co., Texas City, was constructed and placed on stream by the regular engineering and plant personnel at the Benavides plant.

Need for the new unit was dictated by an increasing gasoline market and a desire to take advantage of nearby crude sources. By adapting an existing

SCHEMATIC FLOW SHEET of Duval Gasoline Co.'s Benavides plant.

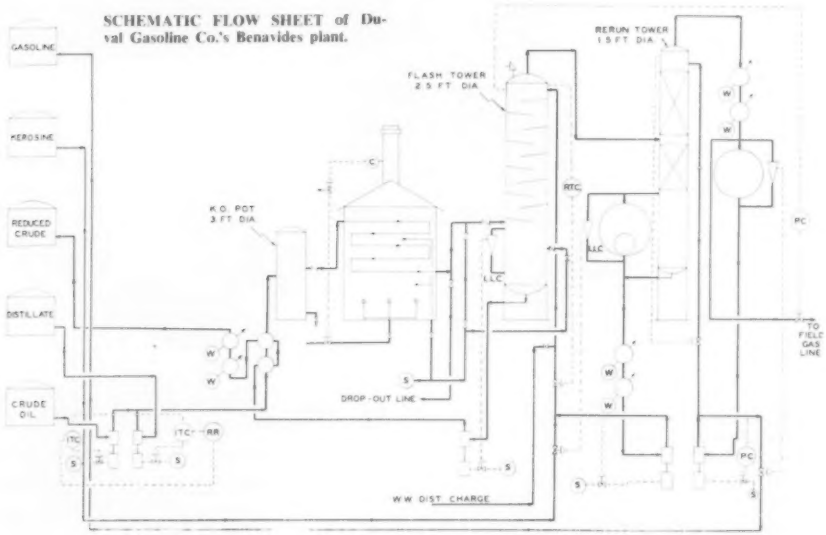


TABLE 1—FLASH UNIT MATERIAL BALANCE

United Gas Co. Distillate (8,000 Bbl. per Month)

Material—	Per cent	°A.P.I.	Lb./gal.	Gal./hr.	Lb./hr.
Loss					
Gasoline	80.0	57.6	6.229	373	2,323
Bottoms	20.0	40.8	6.839	93	636
Total	100.0	54.0	6.350	466	2,959

Duval Pipe Line Co. Crude Oil (8,108 Bbl. per Month)

Material—	Per cent	°A.P.I.	Lb./gal.	Gal./hr.	Lb./hr.
Loss					
Gasoline	37.0	54.6	6.330	175	1,108
Reduced crude	63.0	37.5	6.973	298	2,078
Total	100.0	43.4	6.736	473	3,186

Composite of Both Materials (16,108 Bbl. per Month)

Material—	Per cent	°A.P.I.	Lb./gal.	Gal./hr.	Lb./hr.
Loss					
Gasoline	58.36	56.6	6.261	548	3,531
Diesel	9.90	40.8	6.839	93	636
Reduced crude	31.74	37.5	6.973	298	2,078
Total	100.00	48.5	6.544	939	6,145

TABLE 2—FLASH UNIT HEAT BALANCE

Material—	Rate, lb./hr.	Phy. state	Temp., °F.	B.t.u./lb.	Heat, B.t.u./hr.
Heat out:					
Distillate	2,959	Vapor	450	325.9	964,338
Reflux*	2,034	Vapor	450	314.4	639,286
Gasoline†	1,108	Vapor	450	325.9	361,097
Reduced crude	2,078	Liquid	500	258.1	536,332
Total heat out					2,501,053
Heat in:					
Distillate	2,959	Liquid	220	94.8	280,513
Reflux*	2,034	Liquid	450	228.7	465,176
Crude oil	3,186	Liquid	220	93.0	296,298
Total heat in					1,041,987
Heater duty:					
Heat out					2,501,053
Less heat in					1,041,987
Heater duty					1,459,066
Transfer-line temperature, °F.					530
Pressure drop through heater for minimum vaporization, psig.					45

$$*\text{Reflux} = \frac{\text{Distillate plus gasoline from crude}}{2}, \quad \dagger\text{Gasoline from crude.}$$

rerun tower for the unit acquiring two other major pieces of equipment, namely the flash tower and crude-oil heater, engineers were able to increase gasoline and kerosine yield of over-all plant operations.

Process flow . . . The distillate-crude oil charges to the unit are almost equal. Each month 8,000 bbl. of United Gas Co. distillate and 8,108 bbl. of Duval Pipeline Co. crude are processed through the unit in a joint stream. The incoming distillate and crude oil are stored in separate storage tanks until they are charged to the unit. Upon leaving the storage tanks, the two streams commingle by way of a simple tee and the combined stream is the charge stock.

The combined flow passes through heat exchangers where it is preheated by exchange with bottoms from the flash tower. The charge stock is then further heated in an 2,500,000 B.t.u. per hour crude-oil heater and flashed in the lower section of the flash tower. The heater—one of the major pieces of equipment which had to be added—has been oversized so that it may accommodate additional loads should future plant needs so require.

Flashing . . . The flash tower is a 2½-ft.-diameter vessel containing nine sieve-type trays arranged as splash trays. The tower was originally designed for a different use at Republic's Texas City refinery but was never used and has been adapted to this unit. Reduced crude from the bottom of the flash tower is cooled by heat exchange with charge stock, is further cooled in air coolers and then returned to storage. The reduced crude is piped to Republic at Texas City for further processing.

Vapor overhead from the flash tower is feed stock for the rerun tower, where the kerosine and gasoline are split. Rerun overhead passes to an accumulator where liquid is removed and pumped to gasoline storage. Uncondensed gas from the accumulator is piped to a field gas line.

Reflux . . . Bottoms from the rerun tower are cooled and sent to kerosine storage. The rerun bottoms are partly used as reflux for the flash tower and are charged above the topmost plate. A limited amount of water-white distillate obtained from a nearby cycling plant is also charged to the reflux line of the flash unit.

A distinctive part of the skimming plant is the control room and panel which was designed and constructed by the Duval group. All instrumentation has been concentrated within one small building. Paneling has been so arranged that it shows the operator the complete flow throughout the unit at a glance, facilitating rundown of difficulties during upsets.

Personnel at the Benavides plant include B. C. Harrison, superintendent and P. R. Coronado, process engineer.

Oil-Water Contact In a Reservoir

(Continued from page 115)

of a gas cap can be isolated by preparation of a gas-oil-ratio contour map. At the updip side of the reservoir, the gas cap may be recognized by the grouping of an area of high-gas-oil ratios.

E. Geologic Cross-Sections.

1. The gas cap of a reservoir may not be visualized readily from the maze of completion records in a new field. A geologic cross-section may be used to establish the gas-oil interface by arrangement of a line of well logs extending into the dip. Pay-section detail logs, both electric and radioactivity types, are placed side by side and aligned to a subsea datum. Upon these logs are superimposed core descriptions, core analyses, and drill-stem-test records. The suggested contact lines are drawn. This is formalized finally in a geological cross-section to appear as an exhibit in the pool report.

The previous discussion was related primarily to the determination of the original gas-oil interface. Once the reservoir is produced or subjected to injection operations, readjustment occurs in the distribution of gas, oil, and water. In tracing the rise of the gas-oil interface, the gas-oil ratio contour map is applicable. This method is used also to trace the effect of pressure-maintenance operations on reservoir performance.

West Texas drilling contractor gets from one American Tiger Brand

THERE's a drilling outfit in Midland, Texas that knows all the tricks for getting the most service out of its wire lines. It's the Karl B. King Drilling Company.

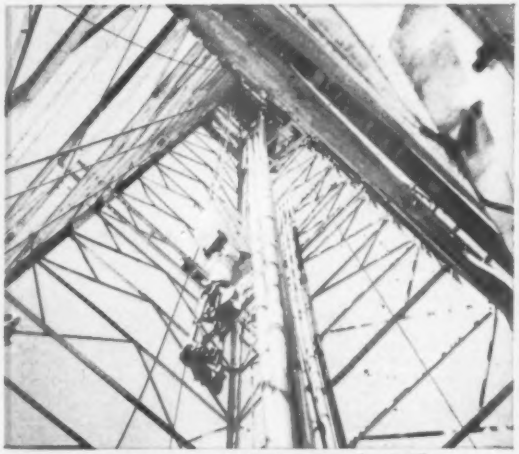
Here's how they did it. For many years, they kept accurate records of each wire line used and noted all the factors that had some effect on wire line life. One line gave 89,625 ton-miles of service. It drilled 23,200 feet of well and was used for 10 months. This was an American Tiger Brand 1¼" 6 x 19 line, Excellay Preformed, 5000 feet long with Independent Wire Rope Core. The cost of the line per ton-mile was the lowest of any of the lines tested.

Keeping ton-mile records of wire line service takes time but it is the best method known for determining which lines last longest and what factors do most to increase wire rope life.

Factors that contributed to long rope life

1. Choice of a brand well-known for long service—American Tiger Brand.
2. Choice of the right construction and size—1¼" 6 x 19 (IWRC) Excellay Preformed.
3. Superior lubrication, applied at the factory, lasted the life of the rope.
4. Grooved drum reduced wear on rope.
5. Care in handling the rope kept it free from mud and sand.
6. Selection of a rope long enough so that an efficient moving and cutting practice could be effected.
7. Proper alignment of equipment.
8. Manganese steel sheaves were used and kept free from rough spots.

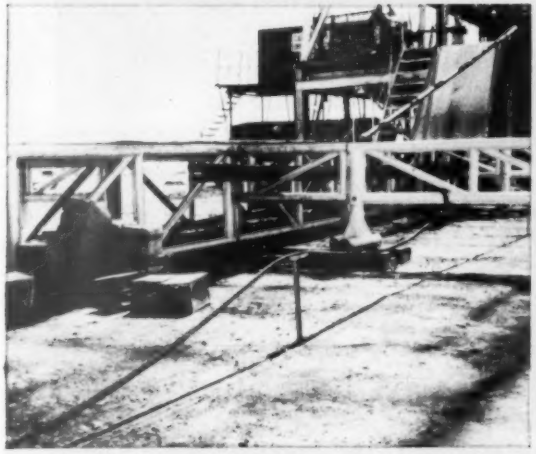
To help you get the most service out of your wire lines, American Steel & Wire maintains a Wire Rope Specialist in each oil field. He "knows his ropes" and can save you plenty of money by helping you set up better wire rope practices on the job. This service is available at any time through your local supply store.



89,625 ton-miles of service from one American Tiger Brand Wire Line is considered far above average service in this area.

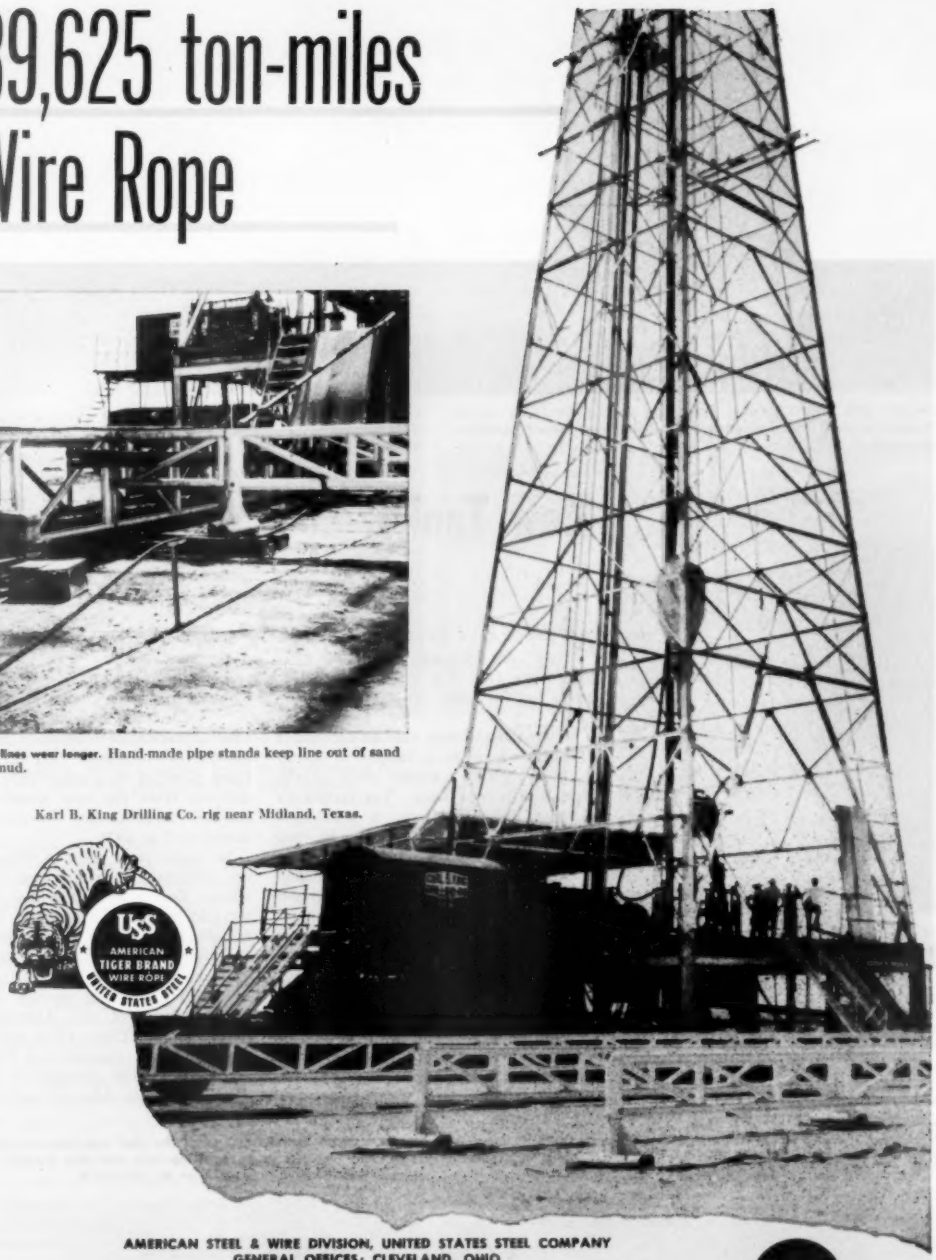
Cutting off worn end of line adds considerable ton-miles of service. So does the grooved drum.

89,625 ton-miles Wire Rope



Clean lines wear longer. Hand-made pipe stands keep line out of sand and mud.

Karl B. King Drilling Co. rig near Midland, Texas.



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UNITED STATES STEEL

UNION OIL CO. TANKER taking on a crude-oil cargo at the Ventura terminal while simultaneously discharging refined products. Anchored in 45 ft. of water over 4,000 ft. offshore, the ship is connected to a 20-in. submarine line by a 175-ft., 10-in. flexible loading hose. Loading operations are expedited by radio-telephone communication.

Most of the contents of this 135,000-bbl. floating-roof tank have just been transferred to a tanker lying offshore.

New Tanker-Loading Terminal

. . . Union Oil loads cargo at 10,700 bbl. per hour

by D. H. Stormont
West Coast District Editor

AT Union Oil Co's new tanker terminal near Ventura, Calif., crude is loaded so fast that station personnel claim they actually can see the tanker settle.

While these claims may be somewhat exaggerated, crude is loaded so speedily that average tankers drop at the rate of 3 ft. per hour. The terminal's pumping facilities have a maximum loading capacity of 14,500 bbl. per hour and the average cargo loading rate is 10,700 bbl. per hour. Thus normal turnaround time for a 100,000-bbl. tankship is less than 12 hours.

The terminal was erected to provide a better outlet for Union's crude production in the Santa Clara Valley area. At the same time it serves as a gasoline and diesel-oil tank-truck loading terminal for serving the company's markets in the Ventura region.

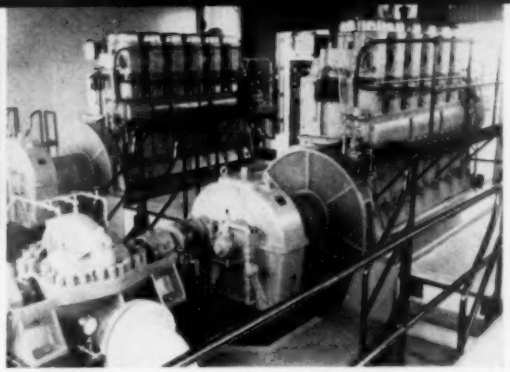
An interesting point concerning the crude movement from Santa Clara Valley fields is that the new line and terminal can be said to be a modern version of the world's first pipe line that 66 years ago made it possible for crude to "go down to the sea in ships." In 1886 a predecessor company of Union, Stewart & Hardinson, laid such a line from Newhall to a point only a short distance from the new terminal. The original 36-mile line, however, was abandoned in 1926.

In recent years most of the pipe line was restored, with the new 8-in. facilities closely following the route of the line Stewart & Hardinson had laid. Installation of an 8-mile link from Saticoy to the new terminal completed the system.

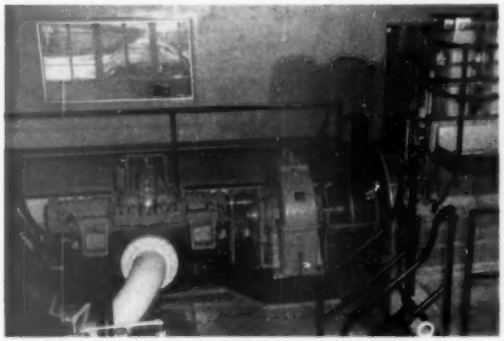
Pumping facilities at the new terminal consist of two United centrifugal pumps. These 12-in. single-stage units normally operate at 1,575 r.p.m. with a discharge pressure of 175 psi. They are driven through Lufkin speed-

CRUDE OIL from Union's properties in the Santa Clara Valley area is brought through a 35-mile, 8-in. line to a 135,000-bbl. tank. When a tanker arrives offshore, crude-loading and refined-product-unloading operations are started. Once the dual operation is started it is important that every man be at his post and that activities be properly synchronized if spillage is to be eliminated.

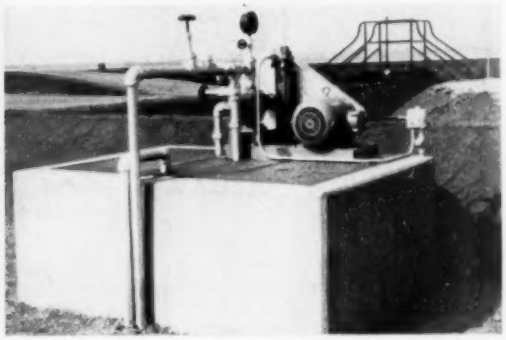
INLET AND DISCHARGE MANIFOLDS serve the centrifugal pumps housed in pump house. Corrugated transite sheathing was used due to severe salt-water corrosion.



DIESEL ENGINE-DRIVEN PUMPS start moving crude at the average cargo loading rate of 10,700 bbl. per hour whenever a tanker anchors offshore.



DRIVEN THROUGH SPEED-INCREASER GEARS the 12-in. centrifugal pumps normally pump from storage to tankship. The manifold system installed, however, permits crude to be circulated from storage and for crude to be pumped back to Santa Paula.



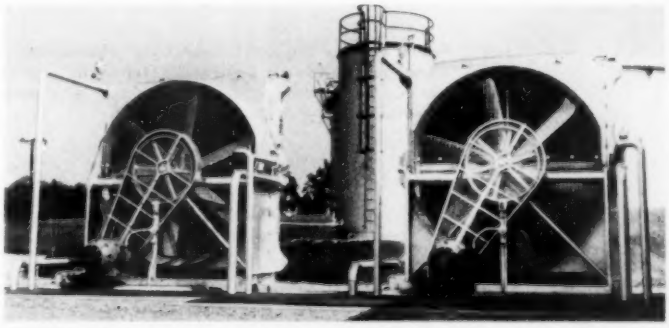
WASTE OIL from engine room and the other sumps in the terminal flow to this central sump. Whenever the level in the sump reaches a certain height, a float-operated switch functions to start a motor-driven pump.

increasing gears, at a ratio of 1 to 3.5, by two 465-hp. Enterprise diesel engines. The pumps take suction from and discharge into 20-in. manifolds.

Crude is pumped to tankers lying offshore through a 4,280-ft., 20-in. submarine line, the longest such line on the West Coast. An interior lining of ¾-in. of concrete was given the line, and a 1-in. exterior coating of concrete and asphalt. The concrete was used mainly to provide weight. However, on the inside, the concrete was installed to give the pipe some protection against galvanic corrosion.

The asphalt coating used is the regular Union Oil Co. seven-coat wrapping job and was put on the pipe to protect it from corrosion. This coating consists of: asphaltic primer, pipe dip, pipe-line felt, pipe-line enamel, pipe-line felt, pipe-line enamel, and an outer wrap of felt. In this installation 25-lb. duck canvas was substituted for the outer felt wrapping.

The inner and outer coatings of concrete resulted in the empty 20-in. line being anchored to the ocean floor by a weight margin of 5 lb. per lineal foot. The line, however, is always kept full so that the weight margin over the displaced sea water is even greater.



ENGINE JACKET-WATER AND LUBE-OIL COOLING is accomplished in these two motor-driven fan-type coolers. Water from a lube-oil heat exchanger is cooled in the lower section and jacket water in upper portion.

An 8-in. coated line 4,200 ft. long was laid for unloading refined products simultaneously with the crude-loading activities. Facilities for storing these products consist of two 30,000-bbl. gasoline tanks and a 10,000-bbl. diesel-oil tank. A 135,000-bbl. floating-roof tank was provided for crude-oil storage, with provisions made for adding a second tank of similar capacity.

Because the terminal is built on marshy ground, with the water level only about 6 in. below surface, a system of dikes was provided around the entire grounds. Hot oil at about 300° F. was sprayed on the dikes. A system of control valves permits trapped water to flow from one dike area to another.

The terminal was designed by Ehrhart and Arthur, Los Angeles.

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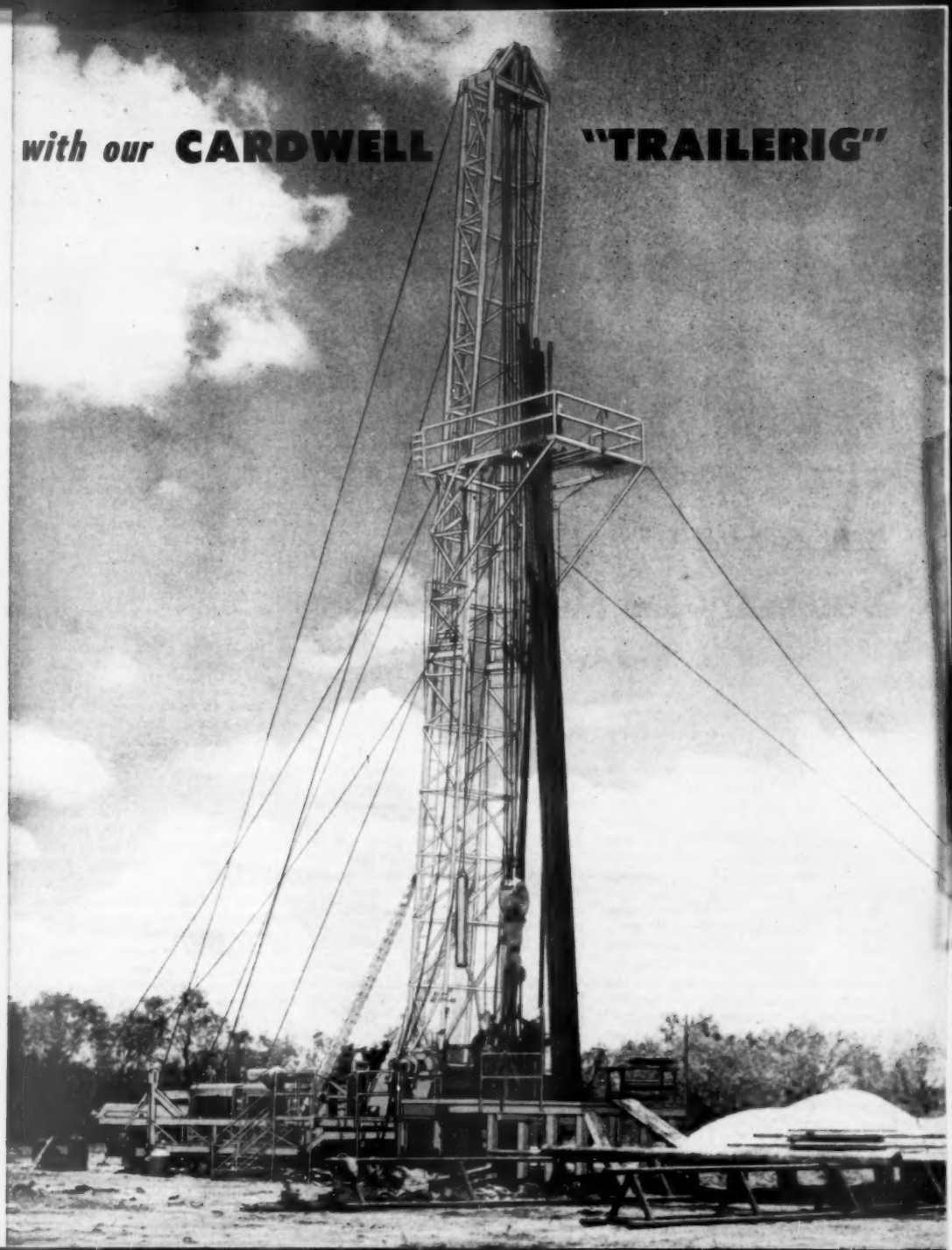

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Fig. 1—Magnolia Petroleum's new mud viscometer.

Fig. 2—Various muds, viscosity versus yield.

PLASTIC FLOW PROPERTIES

Viscometry and Mud Control

by W. B. Lilienthal*

MEASUREMENT of plastic flow properties of drilling fluids in the field presents opportunities for better control of the flow characteristics of drilling fluids. It has been demonstrated[1] that two variables, (1) plastic viscosity and (2) yield value, must be known in order to define the flow behavior of a plastic fluid such as drilling mud. Although this concept has been recognized by many mud control engineers,[2,3,4,5] its application has been handicapped by lack of a suitable instrument to measure such mud flow properties at the drilling location. A multispeed rotational viscometer designed for this purpose was described by Melrose and Lilienthal.[1] This instrument, a multispeed Fann V-G Meter, is illustrated in Fig. 1. Further work with this method of measurement of mud flow properties has proven it to be a valuable tool for mud control.

Plastic Flow Variables

To utilize this concept, two variables must be known in order to describe the flow behavior of a drilling mud, as compared with the one variable (viscosity) required to define the flow characteristics of a so-called Newtonian fluid, such as oil. These two flow properties, plastic viscosity and yield value, may be thought of as separate components, which when taken together, make up the resistance to flow of the drilling fluid. These properties are independent of each other, and each represents a different source of resistance to flow in the mud.

Plastic viscosity is that part of flow resistance in a mud which represents mechanical friction (1) between solids in the mud, (2) between the solids and the liquid which surrounds them, and (3) of the shearing of the liquid itself. The magnitude of the plastic viscosity will depend on the volume concentration and particle shape of solids in the mud and on the viscosity of the liquid. For higher solids concentrations, resistance to flow caused by solids particles rubbing against one another will be higher, and will result in a higher plastic viscosity. Particle shape also has a marked effect on the plastic viscosity, the more asymmetric particles causing the higher resistance to flow.

Field value, the second component of resistance to flow in a drilling fluid, is a measurement of the interparticle forces in the mud. These forces are the result of positive and negative electrical charges located on or near particle surfaces. If the mud is allowed to come to rest the forces tend to move the solids particles around until they reach a geometrical arrangement where the attraction and repulsion forces are best satisfied. A gel-strength measurement is an indication of the magnitude of these forces under conditions of rest. Yield value is a measurement under flowing conditions of those forces in the mud which cause gel strength under rest conditions. It is dependent on volume concentration of solids, the surface properties of the mud solids, and the electrical environment of these solids (concentration and types of ions in the fluid phase of the mud).

Plastic Flow Properties in Mud Control

In general, field control of mud viscosity properties is directed toward maintenance of a constant, and preferably a low resistance to flow. From consideration of the two components of this resistance, it may be seen that except for altering the shape of the solids particles in the mud or adding water to reduce solids concentration, very little may be done to reduce the plastic viscosity of a mud system. Actually, the particle shape is altered in the process of conversion to a calcium base system and, in practice, the relative amount of asymmetrical particles is reduced by adding water and reweighting with barites which are more nearly spherical than most other mud solids.

Yield value, however, is the component of resistance to flow which may be reduced appreciably by means of chemical treatment. The common dispersants used in drilling fluid, such as tannins and complex phosphates, adsorb strongly on the clay particles, and appear to reduce the attractive forces between particles. Thus by reducing the yield value by chemical treatment, the total resistance to flow of the mud is also reduced. However, in many cases addition of a dispersant of this type to drilling mud will also result in an increase in plastic viscosity. This increase, although small by comparison with the reduction of yield value obtained by initial use of the dispersant, becomes appreciable after the minimum yield value for the system is approached, and results in a net increase in resistance to flow, a condition which is usually referred to as "over-treatment."

*Senior research technologist, Magnolia Petroleum Co., Field Research Laboratories, Dallas.

References

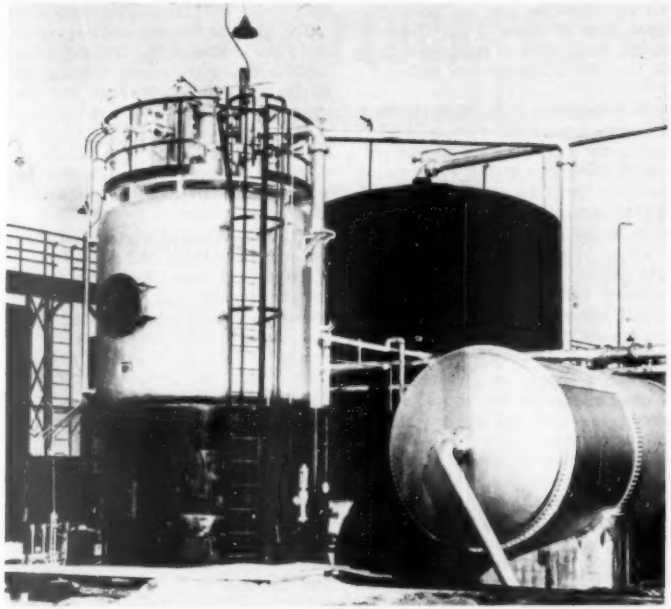
1. Melrose, J. C., and Lilienthal, W. B., Journal of Petroleum Technology, T. P. 3061, 1951, p. 159.

2. Beck, R. W., Nuss, W. F., and Dunn, T. H., A.P.I. Drilling and Production Practice, 1947, p. 9.

3. Herrick, H. N., Trans. A.I.M.E., 1932, p. 476.

4. Marsh, H. N., Trans. A.I.M.E., 1931, p. 234.

5. Rogers, W. F., "Composition and Properties of Oil Well Drilling Fluids," Chapter VII, Gulf Publishing Co. (1948).



NEW ELECTRICAL GASOLINE TREATER, first of its type in commercial use, is shown with the settling tank and one of three acid-treating shells. Photo was taken just after completion and before concrete pad was laid around treating system.

Electrical Treater Solves Problem Of Desludging Cracked Gasolines

Because of the hazards involved in handling gasoline, safety features were included to make operation as safe as possible.

by D. H. Stormont

AN electrical treater installed this year at General Petroleum Corp.'s Torrance, Calif., refinery has proved highly successful in desludging acid-treated cracked gasolines.

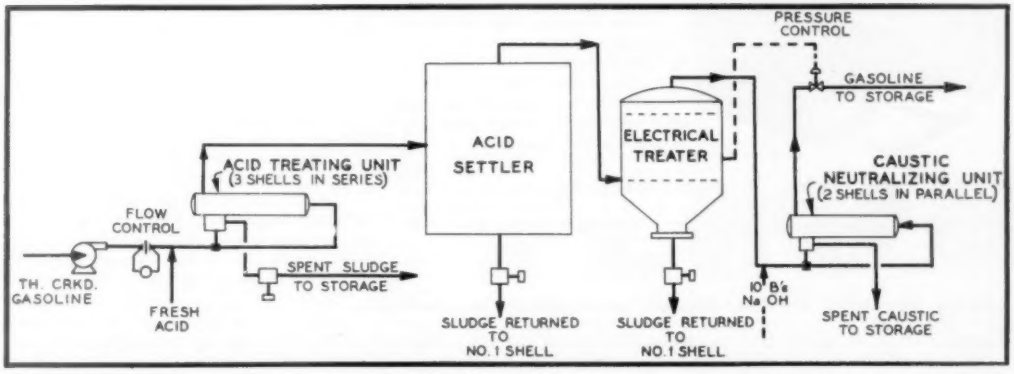
Similar units have been used for treating crudes and gas-oil and other middle-barrel cuts, but this is the first commercial installation for desludging gasoline. This method was developed by Petroleum Rectifying Co. after many years of work and extensive pilot-scale studies.

More thorough desludging is being accomplished by the unit than was done by centrifuging, the former method employed. With less acid sludge remaining in the gasoline, it follows that consumption of caustic in the neutralizing phase is lessened. Sludge recovered is clear, highly fluid, and susceptible to easy handling.

Power consumption is only a small fraction of that consumed by the centrifuges, and still another savings is elimination of centrifuge maintenance. The fact that the electrical treater performs the desludging with greater safety is an added benefit.

The centrifuges formerly used for accomplishing the acid removal had been in operation for years. Continued growth of the refinery had placed such a load on them that no excess treating capacity was available—whenever a machine had to be shut down for repair, product quality suffered if throughput was maintained. Expensive to operate and maintain, about two-thirds of the units needed replacement.

Studies showed this would be a somewhat expensive undertaking. Scarcity of alloys also probably would result in slow delivery, it was believed. Use of sand filters also was studied but because of their high initial cost and need for back washing, they, too, were ruled out. It therefore was decided to try electrical treating.



SIMPLIFIED FLOW DIAGRAM of treating system used by General Petroleum Corp. at Torrance. The electrical treater was inserted in place of centrifuges.

During the several months the unit has been in operation its performance has been highly satisfactory. It handles the Torrance refinery's entire production of thermally cracked, acid-treated gasoline; that is, from the cokers, visbreaker, and gas-oil cracker. Designed to handle 16,000 bbl. daily, throughputs as high as 20,000 bbl. have been made.

Acid treating of the combined gasoline streams is carried out in a series of three shells, in which the gasoline is progressively contacted by less contaminated sulfuric acid. In the line leading to the first shell, acid sludge from the No. 2 shell is injected into the gasoline stream through an eductor. En route to the second drum the gasoline is mixed with acid from the third shell, and before entering the last shell it receives an injection of fresh acid. In each case gasoline is removed from the top of the shell and acid sludge through a boot in the base of the shell.

White acid of about 98 per cent strength is injected at the ratio of 0.5 to 2 lb. per barrel, dependent upon source, using a proportionating pump. Spent acid from the treating system is run to storage and then used in the manufacturing of ammonium sulfate.

Treated gasoline from the No. 3 shell is taken to a settling tank. The drum is of 600-bbl. capacity so that in normal operation the gasoline has a residence time of about 1 hour. Sludge settling in the tank is pumped back to the first shell of the contact system.

Desludging phase . . . Gasoline from the settler enters the Petreco precipitator a few feet above the conical portion of the shell. A distributor placed above the point of entry assures even upward flow of gasoline into the electrode section.

Action of the high-voltage electrical field causes the dispersed particles to coagulate and settle as sludge in the conical section of the unit. From there it is pumped back to the No. 1 shell in the contact system.

Excess gasoline, usually about nine volumes of gasoline for each of sludge, is removed with the sludge. This is done to eliminate any possibility of the sludge becoming packed in the outlet line, although the chance of such happening is regarded as extremely small.

Extreme care was used in the design of the lower distributor, and in the upper one, to assure the upward flow of gasoline would be uniform, free of circulating currents, and would not disturb the deposition of sludge particles. To eliminate vaporization and bubbling, a back pressure of approximately 25 psi. is held on the treater. To eliminate the effect of outside thermal currents, the vessel was thoroughly insulated.

The gasoline stream contains about 0.015 per cent acid (by volume) when introduced into the treater. Content on leaving the unit is 0.001 per cent. Or expressed in terms of H_2SO_4, the acid content is reduced from 0.09 to 0.022 lb. of H_2SO_4 per barrel. Essentially all sludge is removed by the treater; remaining acidity is that from sulfonated material in solution in the gasoline.

When the centrifuges were used, they reduced the acid content to 0.030 lb. of H_2SO_4 per barrel of gasoline. The electrical treater thus is reducing the acid content about one-third lower than was done by centrifuging. This, of course, results in less caustic being needed when the gasoline later is neutralized, and aids in obtaining a maximum-quality product.

The desludged gasoline leaves the treater through the upper collector and flows to the caustic neutralizing system where it is treated to a pH between 7.0 and 7.3. Sodium hydroxide of 10° Baume is injected into the gasoline before it enters either of two shells operated in parallel. Exiting from the shells through the control which maintains a 25-psi. back pressure on the treater, the gasoline is run to storage. It then is redistilled, doctor sweetened, and again run to storage for final blending into motor fuel.

The electrical treater is served by the plant's 440-volt alternating-current power system. Electric power supply for the unit is integrally assembled upon the top of the tank. Since the treater's power consumption is low, desludging is being accomplished with only about 2 per cent of that needed when centrifuges were used.

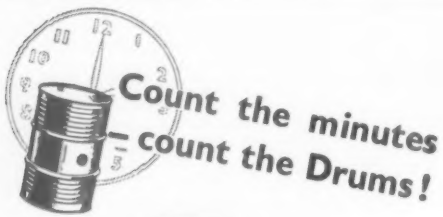
Safety features . . . Because of the hazards involved in handling gasoline, several safety features were included to make the desludging operation as safe as possible. Most important of these are:

1. Provisions for completely venting the unit of all air after it has been shut down. This eliminates danger of an explosive mixture being formed.

2. There is no exposed high-voltage equipment; all switchgear and meters are enclosed in explosionproof housings.

3. A choke coil is provided in the power supply to limit power input. If the sludge should become packed to such an extent a good conductor is established, or if for any other reason flow of power should tend to become excessive, the choke coil acts to limit flow of current through the electrodes.

4. A float mechanism tied into the circuit will not permit power to be applied until the vessel is filled to proper height.



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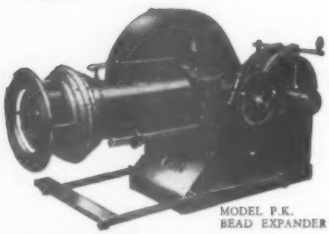
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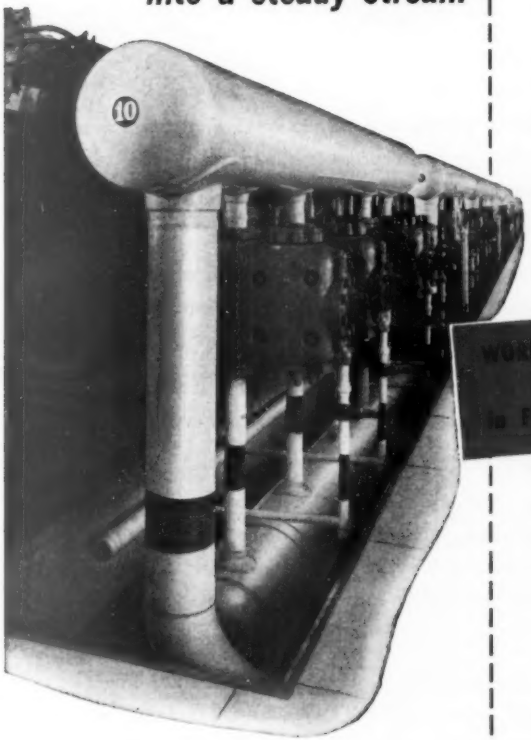

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Fluor Pulsation Dampeners are used on any type gas stream—air, steam, hydrocarbons—at operating pressures ranging from vacuum to 5,000 psi. Dimensions can be tailored to fit space limitations. Units may be installed on the suction and/or discharge lines and are sufficiently flexible to meet minimum pressure drop requirements.

WORKMANSHIP [illegible] are guaranteed in FLUOR PULSATION DAMPENERS

Performance and workmanship are guaranteed in every instance where a Fundamental Pulsation Dampener or Pulsation Dampening System is installed. Here are excerpts from the guarantee:

"The Fluor Corporation, Ltd., guarantees that the pulsation dampeners or pulsation dampening systems . . . conform to all specific code requirements, and the workmanship is in accordance with standard shop practice by qualified welders."

". . . that the equipment will satisfactorily correct conditions of piping vibrations which are due to excessive pulse pressure in the piping system, or correct inaccurate gas metering caused by pulsative flow . . ."

". . . that the dampeners or pulsation dampening systems will decrease the magnitude of the pulse pressure in the compressor plant header piping to a value not to exceed 1.25 percent of the compressor operating pressure. The above percentage reduction applies to both suction and discharge pulsation dampeners or dampening systems . . ."

". . . that the pulse pressure in the plant header piping will not exceed the pulse pressure which is measured in the lateral between the volume bottle and the suction or discharge header, respectively."

". . . that the total pressure loss through the pulsation dampeners or pulsation dampening systems, measured by means of a differential pressure indicator and expressed in pounds per square inch, will not exceed the value set forth on the attached Dimensional Outline Sheet or layout drawing . . ."

Contact your nearest Fluor representative for the answer to your specific pulsative flow problems. Following preliminary study, he will be pleased to recommend the Fluor Pulsation Dampener that best fits your particular requirements. Or, write The Fluor Corporation, Ltd., Los Angeles 22, California.

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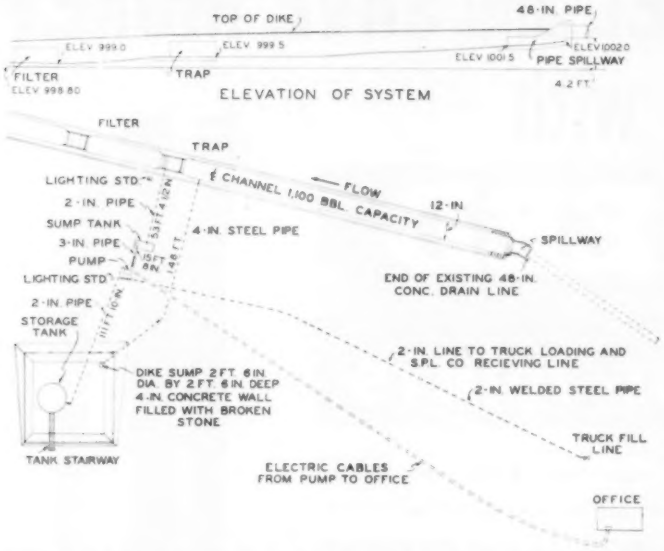


LAYOUT of products recovery system built at Doraville, Ga., to guard against possible stream pollution.

Products Recovery System

Specially designed trap, built by Plantation and Southeastern, safeguards against stream pollution

William P. Sterne

ATLANTA. — A specially designed products trap and recovery system constructed under direction of Plantation Pipe Line Co. at the Doraville terminals near Atlanta serves as a safeguard against possible stream pollution.

The installation was built for the benefit of Plantation Pipe Line Co. and Southeastern Pipe Line Co., and is maintained on a prorata basis. The system has been in operation since January 1950.

Nearby creeks flow across exclusive residential estates in the Atlanta area. Any contamination of these streams by petroleum products could be costly to the companies, and quantity contamination could be disastrous.

Spills start action . . . Prior to construction of the community separator, four spills and leaks of sizable quantities occurred at terminals at Doraville. The most serious of these occurred in 1942, and to a large extent it prompted discussion as to some way in which to keep the products from entering the nearby streams in event of a line break or spillage.

There is a total of about 700,000 bbl. of storage at Doraville within the drainage area. Other companies holding storage here, in addition to the two pipe-line firms are: American Oil Co., The Texas Co., Standard Oil Co. of Kentucky, and Shell Oil Co.

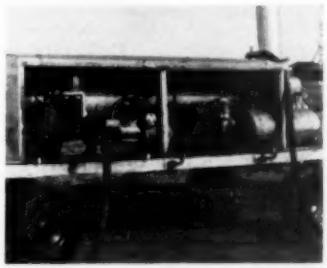
How it works . . . With the installation, in event of a line break, spill, or overflow at any terminal in the vicinity, the product follows the natural drainage into the stream on Southeastern's property, and into the trap and recovery system. The product is skimmed from the surface of the water and pumped into the storage tanks where the accumulation is pumped into a tank truck for return to the owner.

Automatic . . . The pumping setup is completely automatic. When liquids of the sump reach a given level a mercury switch starts the pumping unit. Flow into the separator is controlled by means of a gate at the channel end of the culvert.

Portable Heater and Pump Unit

A trailer-mounted heater and piston-type circulating pump unit have been designed for lease-tank use by Carter Oil Co. engineers. Currently, it is employed in the new oil fields of Beaver County in the Oklahoma Panhandle.

A small, heavy-duty-type single-cylinder gasoline engine drives the circulating pump on one side and the air compressor on the other. The air receiver is a small horizontally mounted cylindrical tank. Oil-resistant hose is used to hook up the unit to lease tanks.



HANDY trailer-mounted heater and piston-type circulating pump unit for lease-tank use, designed by Carter Oil Co. engineers.

GUY-LINE SPOTLIGHTS light derrick floor in the above arrangement used by Pike Drilling Co., Los Angeles, on a job in the Belgian anticline area near McKittrick.

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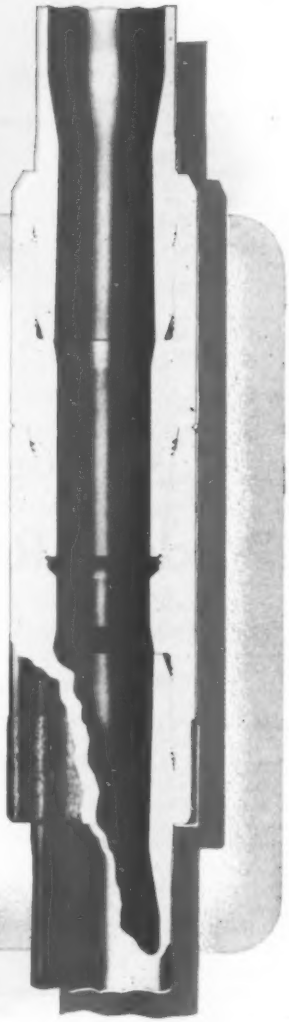

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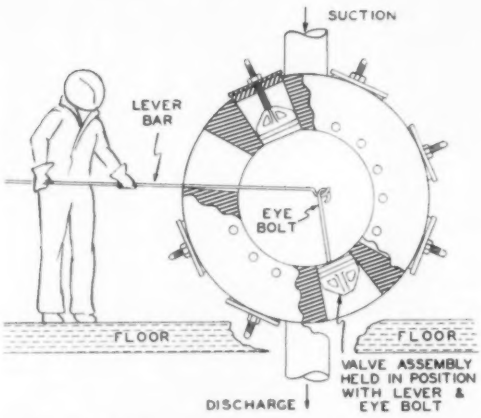
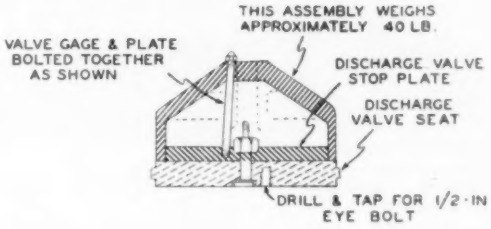


LEVER BAR, inserted into one of the top valve ports and passed through the eye bolt, supports weight of a lower valve while being guided into position.


THIS ASSEMBLY WEIGHS APPROXIMATELY 40 LB.
VALVE GAGE & PLATE BOLTED TOGETHER AS SHOWN
DISCHARGE VALVE STOP PLATE
DISCHARGE VALVE SEAT
DRILL & TAP FOR 1/2-IN EYE BOLT

VALVE ASSEMBLY enlargement showing where discharge valve seat is drilled and tapped for a ½-in. eye bolt to which the lever bar is connected.

Here's a safer way . . . to install valves

INSTALLATION of discharge valves in the gas end of large compressors is made easy by a new safe and simple device. The device consists of a long eye-bolt screwed into a specially tapped hole in the discharge valve seat.

A lever bar inserted into one of the top valve ports, and passed through the eye-bolt, is used to support the weight of one of the lower valves while it is being guided into position from outside the cylinder by the mechanic.

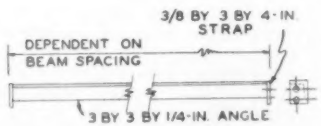
Improves safety conditions . . . Use of this new method eliminates safety hazards which existed formerly. The old way was for the machinist to insert the valve while lying on the compressor floor beneath the cylinder. At best, handling of the valve was a difficult task, with the ever-present danger that one of the valves could slip and fall on the machinist with disastrous results.

Time saver . . . In addition to improving safety conditions, the new procedure permits the entire operation of installing the lower valves to be completed in a fraction of the time previously required.

Earl Nichols, first-class machinist, Baton Rouge refinery of Esso Standard Oil Co., suggested this method.

Portable Scaffold Support

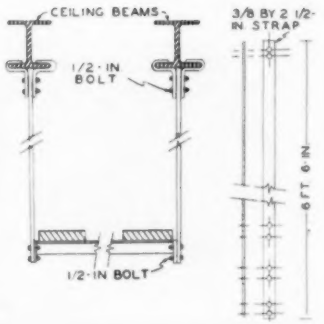
SAVINGS estimated at $1,000 per year have resulted from the installation of suspension scaffold supports installed at the Adams Terminal ammonium sulfate plant of Phillips Chemical Co. at Pasadena, Tex. The



scaffoldings shown in accompanying drawings were placed in use during the general plant shutdown in August 1951 and have been in continuous use since that time.

Before these supports were installed, it was necessary to rent scaffolding when doing overhead painting or sandblasting work on various plant buildings. In addition, a considerable amount of labor cost was expended to erect, disassemble, move, and relocate the rented units. Since the work area available from the old-type scaffolding was very small, it was necessary to relocate the rental units often.

The portable scaffolding has brought about a direct saving in the rental of prefabricated scaffolding. Moreover, these units afford easy mobility and



provide greater working area. The semirigid construction offers additional advantages in that they form a steadier and a safer platform for both painting and sandblasting work.

Improved Spray Nozzle

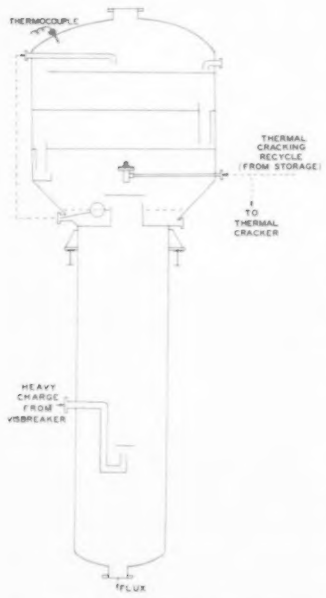
It minimizes coking effect, eliminates down time for coke removal at Kanotex Refining's Arkansas City plant

REDESIGN of a spray nozzle to obtain an umbrella form of spray in handling thermal cracking feed to a vacuum tower minimized the coking effect and eliminated down time for coke removal at the Arkansas City, Kans., refinery of Kanotex Refining Co. The troublesome spray nozzle formerly used is sketched in Fig. 1.

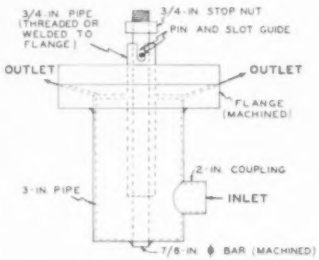
Kanotex engineers built the improved type shown in Fig. 2 from pipe and flange, and it was installed as in Fig. 1.

The result was an arrangement which resulted in a cooling effect that counteracts the tendency towards local overheating from ascending vapors and thus minimizes coking.

Thermal cracking recycle flows through 2-in. coupling up the annular space between the ¾-in. pipe and the ⅞-in. round bar. The bar was machined to fit inside the ¾-in. pipe. Feed emerges between the two halves of the machined flange in the form of an umbrella spray as shown by arrows.



THE OLD WAY of arranging spray nozzle proved troublesome to Kanotex Refining Co. personnel. (Fig. 1).



THE NEW WAY resulted in a cooling effect preventing local overheating from ascending vapors and minimized coking formation. (Fig. 2).

Easier Cleaning

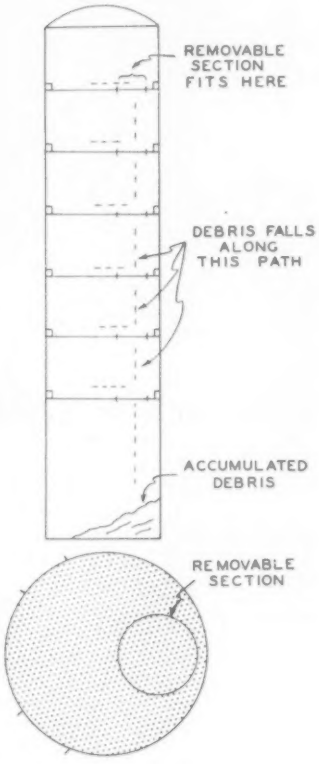
It's no chore now when replacing bell-cap plates

CLEANING the primary towers of cracking coils is no longer a tedious, repetitious chore when removable sections of bell-cap plates are installed.

The old way . . . The old cleaning procedure called for the removal of from 12 to 15 bell caps from each plate in order to wash down a tower. As each plate was washed down, dislodged coke and debris would fall on the next lower plate. In turn, the debris and newly dislodged material would be washed down to the next plate with the same result. The total effect was a cumulative one; the same debris would be handled many times over.

The new way . . . To simplify the task, a circular, removable section was installed in each bell-cap plate equal in area to 12 bell caps. These removable sections were arranged in a vertical line throughout the tower as shown in an accompanying drawing.

Whenever a tower is cleaned, this new arrangement permits all of the removable sections to be taken out of the tower. Debris from the topmost tray will fall directly to the bottom of the tower as will material dislodged from each succeedingly lower tray. Therefore, the cleaning effort and time is reduced since the debris is handled only once for each tray.



Clint Otis Duke, boilermaker helper at the Baytown, Tex., refinery of Humble Oil & Refining Co., suggested this improvement.

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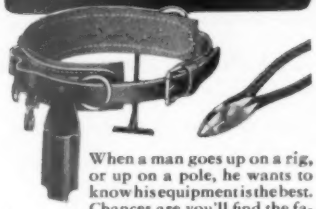
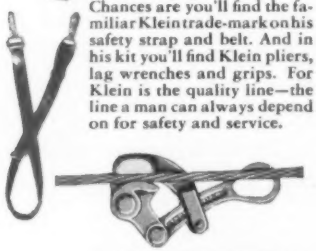


When a man goes up on a rig, or up on a pole, he wants to know his equipment is the best. Chances are you'll find the familiar Klein trade-mark on his safety strap and belt. And in his kit you'll find Klein pliers, lag wrenches and grips. For Klein is the quality line—the line a man can always depend on for safety and service.



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1

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2

Plunger from a pump in acid service. Worked 24 hours a day for over twelve months, more than 4 times as long as previous plunger (not hard-faced).

3

This 1½-inch diameter gasoline pump rod worked constantly for twenty-four months, 8 times as long as it did before being hard-faced. Packing maintenance almost entirely eliminated with Sprayweld surface.

These three pump parts are proof that hard-facing with the Colmonoy Sprayweld Process will save you time and money. Each was in continuous service in Oklahoma's producing fields far longer than is usually considered normal, and the Spraywelding that produced these results was quickly and easily done.

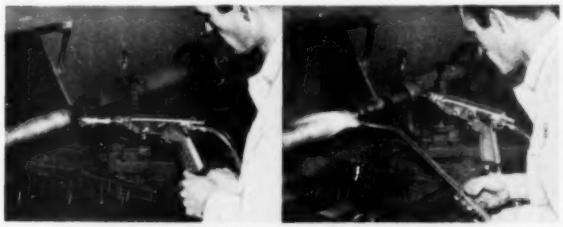
These particular parts were done by the J. P. Machine and Tool Co., Oklahoma City. They were photographed before being Spraywelded with Colmonoy No. 6 again, to repeat their impressive record in the field.

In lasting from 4 to 8 times as long as new, unprotected parts, these reclaimed plungers and rod saved the cost of many new parts and also saved the time usually lost in frequent replacement of worn parts.

The Colmonoy No. 6 overlay, when applied by the Spraywelder, is smooth and dense. It has a low co-efficient of friction, which causes much less wear on the packing. Less pump down-time due to repacking is a real advantage.

Instead of buying new replacement parts, call the nearest Wall Colmonoy branch office and find out where you can have Spraywelding done. Then you can spend less time and money on maintenance, and get longer pump service.

There are two basic steps in the Sprayweld Process. First the powdered Colmonoy alloy is sprayed on with the Spraywelder. Then this overlay is fused with an oxy-acetylene torch to effect a welded bond. See photos. Overlay depth is easily controlled and finishing time is held to a minimum. Write for the Sprayweld Catalog.



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THE JOURNAL'S WEEKLY
Engineering Reference
SECTION
No. 27

FANS AND BLOWERS:

Part 8: Expansion and Extraction Losses

by M. Van Winkle*

THE common equation in fan practice is: $p_w = p_r + p_f + p_s$

From Point 1 to Point 2 (see Fig. 1 of Part 7):

$$-p_w = p_{s2} - p_{s1} + p_{v2} - p_{v1} + p_f$$

where p_v, p_f, and p_s are the velocity, friction, and static pressure and pressure increase from mechanical work, respectively.

In making calculations, density of mixtures must be determined.

Example . . . Compute the density of the following mixture at 1,000° F. and 2-in. H_2O pressure gage:

	Per cent vol.
CO_2	22.0
H_2O	3.0
N_2	59.3
O_2	15.7
Suspended $CaCO_3$ (grains per 100 cu. ft.)	700

Note: Pressure and temperature have little effect on volume of solids compared to gases. Therefore it is not necessary to consider solids in computing change in density with external conditions.

Solution:

$$700 \text{ grains per 100 cu. ft.} = \frac{100 \text{ grains per 100 cu. ft.}}{7{,}000 \text{ grains per lb.}}$$

$$= 0.1 \text{ lb. per cu. ft.}$$

*Professor of chemical engineering, University of Texas.

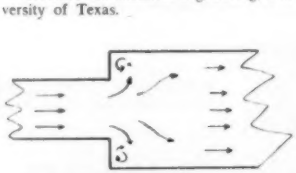

Fig. 1—Illustrating expansion losses.

$$\text{Per mol of gas } \frac{(0.1)(359)}{100} = 0.359 \text{ lb./mol}$$

$$\rho(CaCO_3) = (2.71)(62.4) = 169 \text{ lb./cu. ft.}$$

$$V(CaCO_3) = 0.1/169 = 0.000591 \text{ cu. ft.}$$

per 100 cu. ft. of gas

This volume is negligible in figuring density of mixture.

For 1 mol of gas mixture:

	x	m	xm
CO_2	.220	44	9.69
H_2O	.030	18	0.54
N_2	.593	28	17.20
O_2	.157	32	5.10
		Lb. per mol =	32.53

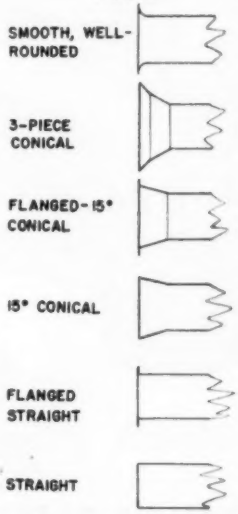

Fig. 2—Factors for entrance losses.

Total weight of 1 mol of mixture plus entrained dust:

$W_m = 32.53 + 0.359 = 32.889$ lb.

Vol. at 32° F., 29.92-in. Hg = 359 cu. ft.

2-in. H_2O gage $= 14.7 + 2(0.0361)$

$= 14.7721$

$$V(1{,}000° \text{ F.}) = 359 \left(\frac{1{,}000 + 460}{32 + 460}\right)$$

$$\times (14.7/14.77) = 1{,}051 \text{ cu. ft.}$$

$$\rho_m(100° \text{ F.}) = \frac{32{,}889 \text{ lb.}}{1{,}051 \text{ cu. ft.}}$$

$= 0.03123$ lb. per cu. ft. **(Answer)**

Energy Losses in Process

Expansion losses are illustrated in Fig. 1. The decrease in velocity of the gas in passing from a smaller to a larger cross-section causes eddy currents and local turbulence which causes energy loss; i.e., the loss in velocity pressure does not entirely convert to static pressure. In abrupt expansion the regain occurs around six pipe diameters downstream. In gradual expansion it can occur as little as two pipe diameters downstream. The total velocity pressure plus static pressure upstream minus the total velocity plus static pressure after regain represents the expansion energy loss.

Expansion losses can be calculated by:

$$p_{fe} = \left(\frac{v_1 - v_2}{1{,}096/\rho^{0.5}}\right)^2$$

where

p_{fe} = frictional pressure loss caused by expansion, in. H_2O

v_1 = upstream velocity, ft. per min.

v_2 = downstream velocity, ft. per min.

ρ = density of gas, lb. per cu. ft.

Entrance and contraction losses . . . Entrance losses are contraction losses and they depend upon the type of entrance. Fig. 2 illustrates the loss factor as a function of entrance type. The entrance loss is calculated by:

$$p_{fc} = p_v F = (F)\frac{\rho v^2}{(2g)(3{,}600)(5.20)}$$

where v is the duct velocity in feet per minute and p_{fc} is in inches of H_2O.

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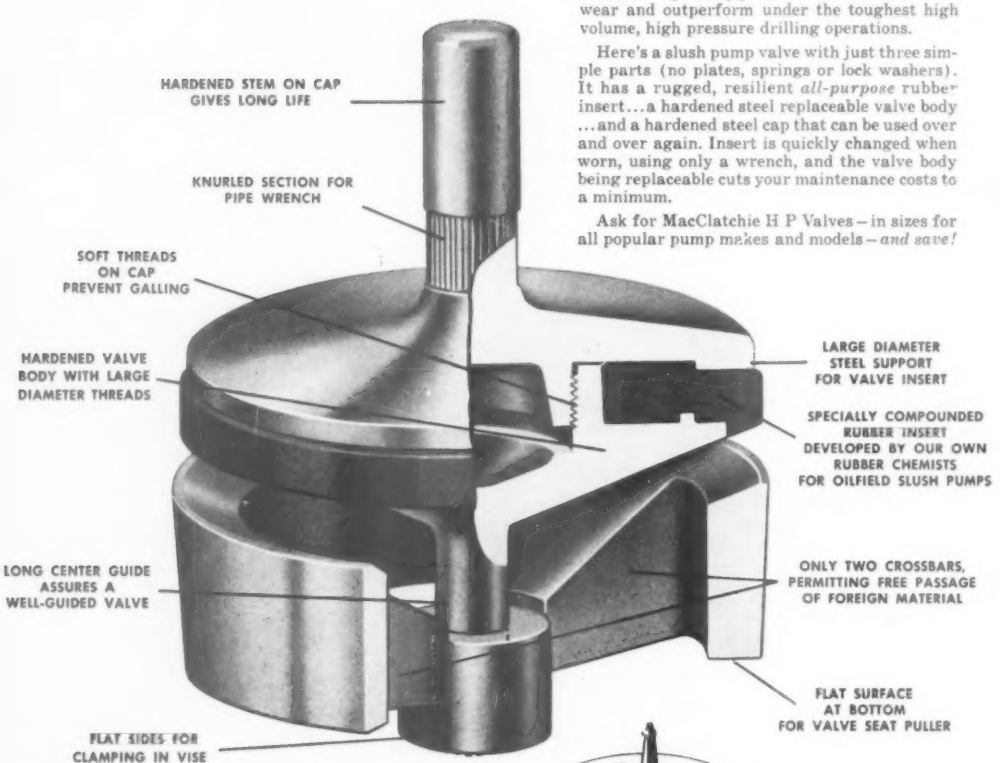
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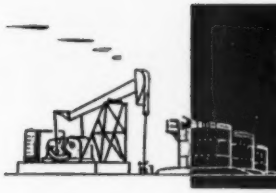

Algebraic Estimate of Reserves From Decline Curves

by Ralph F. Nielsen*

WHEN the future production of a property to abandonment is to be estimated from the current decline, this may be done by largely graphical means, or it may often be done algebraically. In the latter case it is necessary to express the production rate as a function of time by an empirical equation. If this is done, the form of the equation must be examined critically to see whether that form could reasonably be expected to hold the economic limit.

The current production trend may be parabolic, $P = a + bt + ct^2$, but obviously such a relation can only hold for a limited time into the future. The same applies to linear decline or forms for which the production rate does not approach zero asymptotically. Assuming that a satisfactory empirical equation can be obtained for production rate as a function of time, this will serve for calculating the abandonment time and future total production, barring, of course, operational and other changes that would invalidate such use of an equation.

Finding the equation . . . The empirical equation may be found by methods described previously (Engineering Fundamentals Nos. 498 and 499). It must be remembered that the data do not represent instantaneous rates, but totals over a period. Some confusion is therefore avoided if, in finding the empirical equation, the production over a period is regarded as the production rate in the middle of that period. This was the assumption made in connection with the graphical methods of reserve estimation (Engineering Fundamentals No. 497). For example, if time is reckoned in months from June 1, 1950, the June production is the rate, P, at $t = 0.5$.

*Associate professor, petroleum and natural-gas engineering, Pennsylvania State College.

Abandonment time . . . The economic abandonment time is found by substituting the limiting economic rate in the empirical equation and solving for t. This is illustrated in the numerical examples below. In the case of a parabolic decline, of course, only the lowest of the two values of t obtained is significant. Assurance must be had that the economic limit is not near the horizontal part of a parabolic equation or of one which approaches a horizontal asymptote other than zero. If such is the case, the reserves will undoubtedly be overestimated. A linear decline will probably give too low a value if the limiting production is very much less than that in the range of the data.

Estimating total future production . . . The total production is given by integrating the expression for P between the proper time limits. If the reserves are to be estimated as of a certain date, then the value of t corresponding to this date must be found, based on the reference scale. If this is t_0, and t_1 is the value of t found for abandonment, the reserves are found by integrating between the numerical values of t_0 and t_1.

Example 1 . . . In an example previously solved graphically (Fig. 1), the reserves were to be estimated as of September 1, 1952, the economic limit being 360 bbl. per month. The time t is counted from October 1, 1951. The October production is regarded as the value of P for $t = 0.5$, etc., in determining the empirical equation, which is $P = 1{,}910 \times 10^{-0.0324\,t} = 1{,}910\,e^{-0.0746\,t}$.

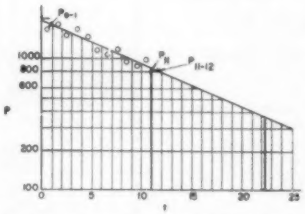

Fig. 1—Reserves from extrapolation of an exponential decline curve.

Substituting 360 for P, $0.0324\,t = \log(1{,}910/360)$ or $t_1 = 22.4$. September 1, 1952, corresponds to $t_0 = 11$.

The reserves are then given by integrating from $t = 11$ to $t = 22.4$, or $R = (1{,}910/0.0746)\,(e^{-0.821} - e^{-1.67}) = 25{,}600\,(10^{-0.356} - 10^{-0.726}) = 25{,}600\,(0.4406 - 0.1879) = 6{,}470$. The graphical method yielded 6,416, the discrepancy being perhaps mainly in the value of the exponent of the empirical equation.

Example 2 . . . In another example the reserves were to be estimated as of July 1, 1952, the economic limit being 2,500 bbl. per year. The data to be used started with the 1945 production, but to obtain a straight line on log paper, time had to be reckoned from January 1, 1940. Hence the 1945 production corresponded to $t = 5.5$, giving the equation $P = 32{,}100\,t^{-0.833}$.

Substituting 2,500 for P gives $t_1 = (32{,}100/2{,}500)^{1.2} = 21.4$. July 1, 1952, corresponds to $t_0 = 12.5$. Integration between 12.5 and 21.4 gives $(32{,}100/0.167)\,(21.4^{0.167} - 12.5^{0.167}) = 192{,}200\,(1.668 - 1.525) = 27{,}400$. The graphical method gave 27,800 using Simpson's rule for the numerical integration.

Example 3 . . . Suppose that the monthly production is given by $P = 180/t + 340/t^2$ where t is measured in months from such a date as to fit this form of equation. Proceeding as before, it was found that $t = 11$ at abandonment, and it is desired to know the reserves as of the date corresponding to $t = 4$. Integration from 4 to 11 gives $(180 \times 2.3)\,(\log 11/4) - 340/11 + 340/4 = 182 - 31 + 85 = 236$.

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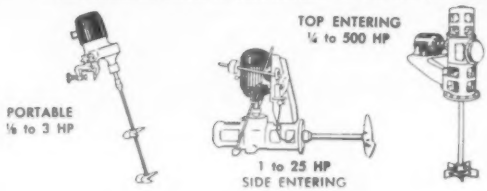

No. 142

REFINER'S NOTEBOOK

ELECTRICAL INSTALLATIONS—2

Explosive Limits

by B. Z. Segall*

THE larger the explosive range, the more hazardous are the areas containing these gases or vapors considered to be by the electrical code, in its groupings of hazardous locations. Thus, for example, acetylene gas has a lower limit of approximately 2.5 per cent by volume of acetylene in air and an upper limit of approximately 80 per cent. Its range of 77.5 per cent is by far the largest range of any presently known gas or vapor and it is shown as Class I, Group A in the code.

Atmospheres containing gases such as hydrogen and manufactured gas have smaller explosive ranges but still of relatively high value. These are shown as Group B. Hydrogen shows a lower limit of about 4.1 per cent and an upper limit of about 75.0 per cent.

Atmospheres containing ethyl ether vapors are shown in Group C. The lower and upper limits are, respectively, approximately 1.0 per cent and 48 per cent. The explosive range, therefore, is about 47.0 per cent.

The final group and the relatively least hazardous one of the four groups is represented by the atmospheres containing gasoline, petroleum, naphtha, alcohols, acetones, lacquer solvent vapors, and natural gas. The following tabulation shows the approximate pertinent data for these flammable materials:

	Explosive limits		Explosive range
	Lower	Upper	
	%	%	%
Gasoline (C_5H_{12} to C_9H_{20})	1.3	6.0	4.7
Petroleum "ether"	1.4	5.9	4.5
Naphtha (safety solvent and 76°)	1.1	6.0	4.9
Alcohol (allyl)	2.4	18.0	15.5
(Butyl-Tert.)	2.35	8.0	5.65
(Ethyl)	3.5	19.0	15.5
(Methyl)	5.5	36.5	31.0
Acetone	2.0	13.0	11.0
Natural gas	4.8	13.5	8.7

*Consulting engineer, New Orleans.

A larger explosive range presents a greater possibility for creating an explosion and then maintaining secondary explosions which will tend to build up terrific pressures within the wiring system. Equipment, apparatus, and fittings must, therefore, not only be designed for operation in Class I Hazardous Locations, but specifically for the particular gas or vapor as shown in the four groupings.

Classifying Hazardous Locations

Basically, the wiring for petroleum installations falls into the Group D Classification. The myriad products, byproducts, and processes attendant to a petroleum operation may produce materials which may fall into other groups. For example, in ammonia synthesis natural gas may be the starting material and hydrogen, nitrogen, and ammonia are formed. Thus both Group B (hydrogen) and Group D (ammonia) gases would be involved. The grouping of any one particular material must be determined from tests of its explosive range. Much information relative to the explosive limits of materials can be obtained from published data. (A very complete compilation of the "Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids" may be found in the National Fire Protection Association's National Fire Codes, Vol. I.)

Inspection . . . In applying the provisions of the code to any location, the authority enforcing the code has to be the sole judge of the code requirements applicable to the apparatus and wiring in the location. Thus, if the inspection for a particular electrical installation comes within the scope of operations of a local municipal inspector, or a local fire bureau inspector, then the entire approval or disapproval of the wiring system is left to the judgment of this local code-enforcing authority. He must classify, he must approve the group selection and furthermore he must consider, as stated specifically in the code:

". . . each room, section, or area (including motor and generator rooms, and rooms for the enclosure of control equipment) . . . individually in determining its classification."

Explosionproof Equipment

The electrical system for Class I Hazardous Locations must be "Explosionproof." The code specifically defines this term "Explosionproof" as follows:

". . . enclosed in a case which

(a) is capable of withstanding an explosion of a specific gas or vapor which may occur within the case, (b) will prevent the ignition of the specified gas or vapor surrounding the enclosure by sparks, flashes or explosions of the gas or vapor within the case."

The first provision is a matter of designing enclosures, cases, etc., with sufficient metal thicknesses, proper contours, proper metals, etc., so that they may withstand the internal explosions. Standardized laboratory tests check these designs to be sure that they will withstand an explosion of a specific gas or vapor within the enclosure.

With reference to the second provision, there are two general standards of construction used to prevent the ignition of the surrounding explosive atmosphere by the hot exploding gases escaping to the outside atmosphere from within the electrical fitting or equipment enclosure.

One class of construction depends upon metal to metal flat joints made up of very accurately machined flat surfaces. These are set up as relatively wide flanges (varying from ½ to 1¼ in.) on the cover portion of the enclosure or case to match similar flanges on the main body of the case. Both portions of the case are held together very tightly by machine bolts. These machine bolts are usually fitted through drilled holes in the cover and drawn up by threads tapped in the main body of the enclosure.

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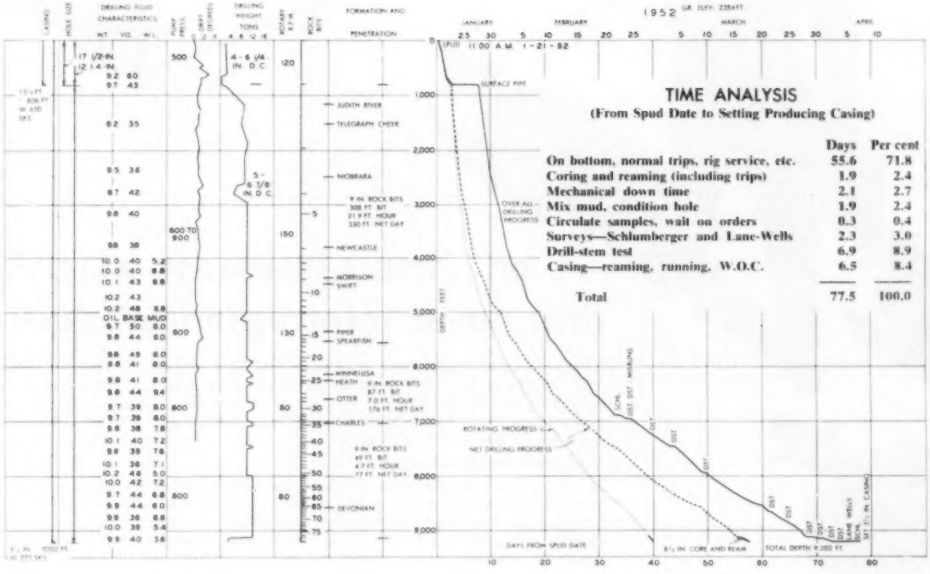

TIME ANALYSIS
(From Spud Date to Setting Producing Casing)

	Days	Per cent
On bottom, normal trips, rig service, etc.	55.6	71.8
Coring and reaming (including trips)	1.9	2.4
Mechanical down time	2.1	2.7
Mix mud, condition hole	1.9	2.4
Circulate samples, wait on orders	0.3	0.4
Surveys—Schlumberger and Lane-Wells	2.3	3.0
Drill-stem test	6.9	8.9
Casing—reaming, running, W.O.C.	6.5	8.4
Total	77.5	100.0

MUD ADDITIVES
(Tabulated From Drilling Reports)

	14 days 0 to 5,039 ft.		54 days 5,039 to 9,202 ft.		
	Total	Per day	Total	Per day	Total
Bentonite, lb.	16,100	115			16,100
Brine Gel, lb.			39,700	735	39,700
Barite, lb.			33,000	612	33,000
Caustic, lb.	295	21			295
Quebracho, lb.	825	59			825
Gypsum, lb.			3,500	65	3,500
Starch, lb.			40,200	745	40,200
Driscol, lb.			420	8	420
Preservative, lb.			3,355	62	3,355
Sodium Bicarbonate, lb.	400				400

BIT SUMMARY

Size (in.)	No. bits	Footage	No. hours	Feet per hour	Feet per bit	Hours on bot. per bit
		DRILLING				
12	1	806	50.0	16.1	806	50.0
9	76	8,315	880.0	9.4	109	11.6
		REAMING				
9	1	81	2.3	35.2		
		CORING				
8¾	1	81	22.5	3.6		

(Compiled for The Oil and Gas Journal by E. A. Polumbus, Jr., Denver)

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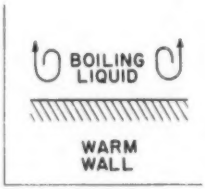
Part 9 of a series

by Dr. B. E. Lauer, Head, Department of Chemical Engineering, University of Colorado

h_f HEAT TRANSFER

COEFFICIENT of HEAT TRANSFER through FILM between WARM HORIZONTAL WALL and BOILING LIQUID



Liquid Movement: Natural Convection.

EQUATION:

$$h_f = c + dq$$

TERMINOLOGY:

h_f - Film coefficient of heat transfer, BTU/hr. sq. ft. $^{\circ}F.$

$c \cdot d$ - Constants depending on liquid boiling at atmospheric pressure.

q - Rate of heat flow, BTU/hr. sq. ft.

LIMITATIONS: Depends on surface. Values above for clean copper surfaces. Values satisfactory except for extremely high or low rates of heat transfer.

SPECIAL DATA: For heat transfer at pressures other than atmospheric ratio h/h_a.

Ratio h/ha	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2
Liquid	Evaporation temperatures								
Water	95	127	154	173	188	200	210	220	229
24% sodium chlor.soln.			178	191	204	214	222	229	237
10% sod. sulphate soln.	128	140	168	180	190	200	211	218	226
26% glycerol	142	168	184	197	207	215	226	237	
Carbon tetchl.	91	103	116	136	153	168	180	190	
Methenol	68	80	108	125	136	148	156	161	
Kerosene	362	380	396	417	428	438			

Values of constants c and d.

Liquid	c	d		c	d
Water	190	0.043	24% sodium chlor. soln.	100	0.030
Ammonia	190	0.042			
10% sodium sul. soln.	125	0.043	Carbon tetrachloride	50	0.025
26% glycerol	125	0.043	Normal butanol	50	0.025
Kerosene	100	0.030	Methylene Chlor.	50	0.025
Methanol	100	0.030	Methyl formate	50	0.025
			Ethyl ether	50	0.025

SPECIAL CASE: For liquids not covered above an approximation of heat transfer coefficients can be obtained by use of the following equations.

$h_f = 45(q)^{\frac{1}{2}}$ q up to 5,000 BTU/hr.sq.ft.

$h_f = 0.64(q)^{\frac{3}{4}}$ q 5,000 to 75,000 BTU/hr.sq.ft.

and for pressure corrections

$$h_f = h_a \left(\frac{p}{p_e}\right)^{0.4}$$

h_a = ht. trans. coeff. at std. atmos. cond.

p_e = press. at std. atmos. cond.

p = press. in sp. occupied by boiling liquid.

REFERENCES:

1. Introduction to Heat Transfer, Brown & Marco, pp. 123-127.
2. Elements of Heat Transfer and Insulation, Jakob & Hawkins, pp. 163-186.
3. Heat Transmission, William H. McAdams, Chapter X.

B 6

COEFFICIENT of HEAT TRANSFER through FILM between COOL PARALLEL FLAT SURFACES and WARM GAS

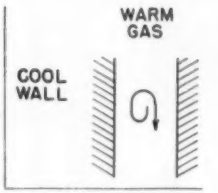


Plate Position: Vertical

Gas Movement: Natural Convection

EQUATION:

$$h_f = 0.116\, k \left[\frac{\rho^2 \beta g \Delta t c}{\mu_f^2}\right]^{\frac{1}{3}}$$

TERMINOLOGY:

h_f - Film coefficient of heat transfer, BTU/hr.sq.ft.$^{\circ}F.$

k - Thermal conductivity of gas at t_f, BTU/hr. ft.^{2} $^{\circ}F./ft.$

ρ - Density of the gas at t_f, lb./cu. ft.

g - Acceleration of gravity. 4.17×10^8 ft./hr.^{2}

β - Coefficient of volumetric expansion of gas at t_f; for ideal gas is equal to $1/^{\circ}R.$ (cu. ft./cu. ft.)/$^{\circ}F.$

Δt - Temperature difference between wall and gas, $^{\circ}F.$

μ_f - Viscosity of gas at t_f, lb./ft. hr.

C - Specific heat of gas at constant pressure, BTU/lb. $^{\circ}F.$

t_f - Film temperature, assumed as arithmetic average of wall temperature and bulk gas temperature, $^{\circ}F.$

LIMITATIONS: This equation is only true for plates 80 mm. or more apart & for plates of reasonably large area. For diatomic gases or other "perfect" gases.

PHYSICAL CONSTANTS: The values of the physical constants such as density, viscosity and others are reported in the International Critical Tables, in several handbooks, and in the technical literature.

Volume and page references in the International Critical Tables are as follows:

for ρ -- Organic liquids I, 176-280; Gases III, 3-22; Liquids III, 22-34; Solutions III, 81-198; Refrigerating solutions II, 327; Glues II, 218; Oils, fats and waxes II, 209; Liquid fuels II, 136-156; Gaseous fuels II, 166-167.

μ -- Gases V, 1-6; Liquids V, 10-12; Solutions V, 12-25; Fluidity = $1/\mu$ - V, 25-52; Refrigerating solutions II, 328; Glues II, 220; Oils, fats and waxes II, 209; Liquid fuels II, 136-166.

β -- Gases III, 3-22; Liquids III, 439-440; Solids III, 51-196; Liquid metals II, 463; Refrigerating solutions II, 327; Oils, fats and waxes II, 210; Liquid fuels II, 144.

k -- Gases V, 213-216; Liquids V, 226-229.

C -- Gases V, 79-84; Elements V, 92-94; Liquid chemical compounds V, 106-113; Pure liquids V, 113-115; Solutions V, 116-117, and V, 112-129; Refrigerating solutions II, 328; Oils, fats and waxes II, 210.

References:

Colburn & Hougen, Ind. & Engr. Chem., Vol. 22, p. 522, (1930).

C 1 a

COEFFICIENT of HEAT TRANSFER through FILM between COOL PARALLEL FLAT SURFACES and WARM LIQUID

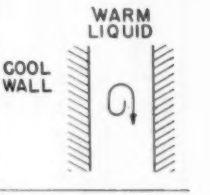


Plate Position: Vertical

Liquid Movement: Natural Convection.

EQUATION:

$$h_f = 0.128 \left[\frac{K^2 \rho^2 c \beta g \Delta t}{\mu}\right]^{\frac{1}{3}}$$

TERMINOLOGY:

h_f - Film coefficient of heat transfer, BTU/hr.sq.ft.$^{\circ}F.$

k - Thermal conductivity of liquid at t_f, BTU/hr. sq. ft. $^{\circ}F./ft.$

ρ - Density of liquid at t_f, lb./cu. ft.

g - Acceleration of gravity. 4.17×10^8 ft./hr.^{2}

β - Coefficient of volumetric expansion of liquid at t_f.

Δt - Temperature difference between wall and liquid, $^{\circ}F.$

μ - Viscosity of liquid at t_f, lb./ft. hr.

C - Specific heat of liquid at constant pressure in BTU/lb. $^{\circ}F.$

t_f - Film temperature, assumed as arithmetic average of wall temperature and bulk liquid temperature, $^{\circ}F.$

SOURCES OF DATA:

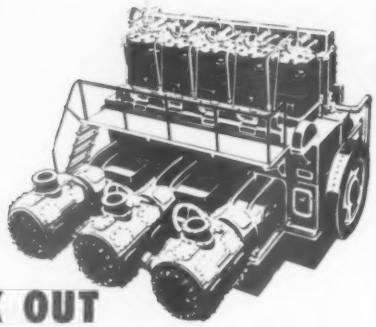
For physical constants for use in above equation see Chemical Engineers' Handbook - J. H. Perry (1948).

for ρ -- see pp. 130-148, 175-195, 1583.
μ -- see pp. 370-374, 1198, 1696.
β -- see pp. 200-202, 1875.
k -- see pp. 459-461, 1302, 1697.
C -- see pp. 225-235, 297, 1588, 1696.

REFERENCES:

1. Colburn and Hougen, Ind. Engr. Chem., Vol 23, p. 522, (1930).
2. Applied Heat Transmission, J. H. Stoever, p. 60.

C 2 a



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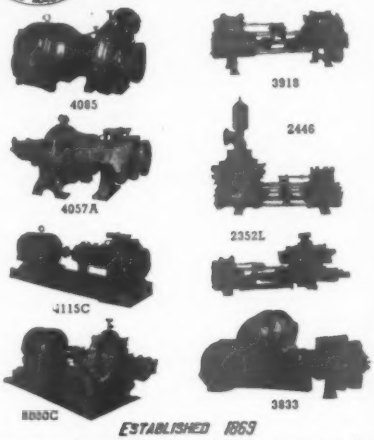

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by W. L. Nelson
Technical Editor

QUESTIONS ON TECHNOLOGY

Determining the Hydrogen Sulfide Content of Crude Oils

"In your page of August 4, 1952, entitled 'What Are "Sour" Crude Oils?' you mention the dissolved hydrogen sulfide content of 0.05 cu. ft. per 100 gal. How do you determine the gas content?"—A. F.

The amount of dissolved hydrogen sulfide in a crude oil, gas oils, or heating oils can be determined by the analytical method (Esso Standard Oil Co., General Safety Committee) shown below. The dissolved hydrogen sulfide content is used in deciding if an oil is "sour." A content of 0.05 cu. ft. per 100 gal. indicates an oil that is dangerous to refinery personnel, whereas the higher content of 0.5 cu. ft. is dangerous because it causes vigorous corrosion in tanks. The sulfide scale that is formed may spontaneously ignite when first exposed to the air.

DISSOLVED HYDROGEN SULFIDE. Two hundred milliliters of the sample plus 100 ml. Varsol (to lower the viscosity) are placed in a 500-ml. gas washing bottle equipped with a fritted disk of medium porosity. The outlet of this bottle is connected by means of rubber tubing to a second similar gas-washing bottle containing 50 ml. of 10 per cent cadmium chloride in 2.5 per cent (by volume) hydrochloric acid solution and 200 ml. of water. The washing bottle containing the sample is placed in a bath at approximately 140° F. and nitrogen bubbled through for 3 hours at such a rate that the sample does not foam over.

At the end of the 3 hours, the cadmium chloride solution containing the precipitated cadmium sulfide is filtered through filter paper. The bottle is rinsed with water, the rinsing being poured through the filter paper. The filter paper is placed in the gas washing bottle and a known quantity of approximately 0.01 normal iodine solution is added, sufficient for an excess. Twenty-five milliliters of concentrated hydrochloric acid are then added, part being poured through the fritted disk to dissolve any adhering cadmium sulfide. After the cadmium sulfide has dissolved, the solution is back titrated with standard 0.01 normal sodium thiosulfate, using starch solution as an indicator. A blank is run, using the same quantity of iodine, hydrochloric acid, and water. The difference in the thiosulfate titrations is the amount of iodine consumed.

Ml. I_2 consumed $\times$ 0.0075 = cu. ft. of H_2S per 100 gal. oil.

In addition to sour crude oils that contain dissolved hydrogen sulfide, there are many crude oils that are classified as "high sulfur" oils. These generate hydrogen sulfide upon heating to 400° F. or higher, but they differ in this respect, some liberating much hydrogen sulfide while in others the sulfide tends to stay with the residue. Thus, in addition to Dissolved Hydrogen Sulfide, there is "Potential Hydrogen Sulfide." The latter, i.e., potential, cannot be easily defined because the amount of hydrogen sulfide that is liberated depends somewhat on the amount or kind or heating that is conducted. However, one analytical method for "potential" hydrogen sulfide is *(Davis, Jones and Neilson, The Oil and Gas Journal, May 26, 1938):*

POTENTIAL HYDROGEN SULFIDE.

Apparatus:

(a) Long-neck 1,000-ml. flask with thermometer well.

(b) Thermometer high-range A.S.T.M. (D 86-40).

(c) Adapter neck and steam delivery tube and source of steam.

(d) 18-in. water-cooled condenser.

(e) Special adapter.

(f) 500-ml. Erlenmeyer receiver.

(g) A.S.T.M. absorber (D 90-41T).

Solutions:

(a) Hydrochloric acid, 0.2 N.

(b) Hydrochloric acid, 4.0 N.

(c) Potassium hydroxide, 5 per cent KOH.

(d) Cadmium nitrate, 10 per cent Cd $(NO_3)_2$.

(e) Standard silver nitrate, 7.328 g. $AgNO_3$ per liter.

(f) Standard iodine solution, 0.9227 N I_2.

(g) B.D.H. Universal indicator.

(h) Potassium-chromate indicator, 5 per cent K_2CrO_4.

Procedure:

(a) Place 50 ml. of 5 per cent potassium hydroxide in both receiver and in absorber.

(b) Deliver 500-ml. crude oil to be tested into the flask.

(c) Heat is applied, and the temperature raised to 250° F. in 10 minutes.

(d) Steam introduced into flask is so regulated that approximately 40 ml. of water condensate will form throughout the distillation.

(e) Heat is applied at such a rate that 500° F. is attained in 30 minutes and 650° F. in an additional 15 minutes.

(f) At 650° F. the heating and steam injection is immediately stopped.

(g) Transfer solution from absorber into a 40-ml. beaker, and rinse with two 15-ml. washes of distilled water.

(h) Transfer contents of receiver to a separatory funnel, shake thoroughly, settle, and draw the solution into the same beaker. Rinse the receiver and the gasoline with two 15-ml. washes of distilled water, and transfer the wash water to the beaker.

(i) Carefully neutralize the solution to a pH of 6.5-7.0 with dilute nitric acid; then preciditate the sulfide and mercaptans with a small excess of cadmium nitrate solution. Let stand 30 to 60 minutes and filter through quantitative filter paper. Wash sparingly with cold distilled water, adding the wash water to the filtrate.

(j) Readjust the filtrate to a pH of 6.5, add 2 ml. of chromate indicator, and titrate with silver nitrate.

(ml. $AgNO_3$ — ml. blank) $\times$ 1.1 = lb. HCL per 1,000 bbl.

(k) Cadmium sulfide and mercaptides are separated by washing the precipitate on the filter paper with a small volume of 0.2 N hydrochloric acid. The volume of acid required should be determined by experience for any given crude. The precipitate is washed repeatedly by returning the acid filtrate to the precipitate, which should be stirred while washing, to obtain complete removal of the mercaptides. Finally, sparingly wash the precipitate with distilled water, and discard the washings.

(l) The precipitate of cadmium sulfide is transferred with the filter paper to a beaker; add 100 ml. distilled water; disperse the precipitate in the water by stirring. Add 20 ml. of 4 N hydrochloric acid (to make the total solution 0.6 N HCl) and titrate the liberated sulfide with standard iodine solution, using starch as an indicator.

(Total ml. I_2 — ml. blank) $\times$ 1.1 = lb. H_2S per 1,000 bbl.

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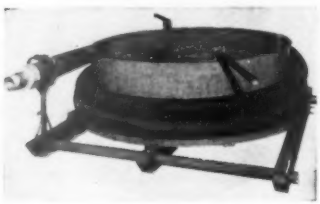
IT'S NEW CHECK IT

by Dan B. Miller

22 SCOTCHRAP pipe insulation is packaged and sold by the square. Use of the polyvinyl chloride tapes eliminate the need for tar pots and cumbersome equipment, yet provides an economical, pinhole-free cold coating that can be applied easily and safely in a single step by regular pipe-line crews. They are especially advantageous for short jobs or inaccessible locations. In addition to protection against corrosion and chemical attack, the polyvinyl chloride tapes also provide good dielectric qualities (10,000 to 22,500 volts), are nonabsorbant, and abrasion resistant. A new 1½-in. core size makes both tapes adaptable to automatic and hand-operated pipe-wrapping equipment. Scotchrap No. 50 is 10 mils thick and is recommended for wrapping joints where comformability to irregular surfaces is desired, while the No. 51 tape is 20 mils thick and is recommended for wrapping straight runs of pipe. No. 50 tape has a tensile strength of 25 lb. and adhesion strength of 25 oz. per inch of width. Dielectric strength is 10,000 volts and insulation resistance 200,000 megohms. No. 51 tape has a tensile strength of 60 lb. and an adhesion strength of 20 oz. per inch of width, while dielectric strength is 22,500 volts and insulation resistance is 200,000 megohms. *Minnesota Mining & Manufacturing Co.*

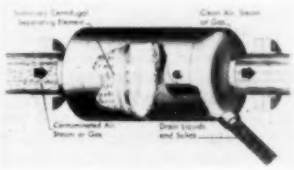
IT'S NEW CHECK IT

23 SPECIAL SKID-MOUNTED ROTARY HOSE RACK for storing and transporting hose between locations, eliminates careless handling of the hose which may result in damage causing it to leak prematurely. The hose is wrapped around a shell 5 ft. in diameter which rotates on roller bearings. As the hose is unwound it runs through an eye which prevents kinking and damage to the hose. The unit is mounted on skids 6 by 10 ft. The inner part of the rack forms a bin which may be used to carry small tools and instruments. The rack is designed to take all makes, sizes, and different lengths of hose. *Goodall Rubber Co.*



IT'S NEW CHECK IT

24 IMPROVED HI-EF PURIFIER removes 99 per cent of all dirt and moisture in steam, gas, and vapor lines. This compact, simply designed purifier performs automatically and without any moving parts or baffle plates, removing virtually 100 per cent of all dirt, oil, moisture, and guck even at extreme velocities and pressures. The purifier removes the entrainment through a new stationary centrifugal separating element. The entrainment-laden vapor entering the purifier is engaged by this element which imparts a carefully controlled but extremely rapid rotational motion to the vapor. This action throws all solids and water outward to the walls of the purifier. Here it is ejected out the drain. The entire action occurs without any appreciable drop in pressure, and the greater the velocity through the unit the better the separating efficiency. This line type purifier is made in all standard sizes up to 24-in. for pressures up to 600 psig. Except for low-pressure types, all units are designed, built, and stamped to A.S.M.E. code for unfired pressure vessels. All units have forged steel flanges with borders of welded-steel construction. *V. D. Anderson Co.*



IT'S NEW CHECK IT

25 NEW HIGH-PRESSURE HYDRAULIC BOOST PUMP. Model S-216-C performs static testing on pipe and christmas trees, ejects core samples, pumps out sanded-up pump barrels, and will pump mercury. Six standard models are offered for output fluid pressures to 30,000 psi. from 100 to 150-psi. plant-supplied air pressure. Boost pumps with capacities to 50,000 psi. are supplied on special order. Standard models are for oil or water service. Special models are available for corrosive fluids. Sprague

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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GUIBERSON 65 TON SWIVEL

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Full-Floating Washpipe

The Assembly That Multiplies Packing Life... Never Needs Adjustment!

Only Guiberson can give you the *full-floating washpipe* —a radical departure from conventional washpipe packing design, that actually cuts packing wear in half and multiplies the life of the assembly. This revolutionary assembly will operate for months without attention other than greasing!

Here are some of the definite advantages the Guiberson full-floating washpipe can give you:

- Packing wear greatly reduced — elements last several times longer than conventional type.
- No adjustment—needs no initial setting or adjustment maintenance.
- Pressure squeeze cannot be transmitted from one seal ring to another as in other assemblies.
- Can be completely lubricated with pressure gun while in operation.
- Friction co-efficient of packing material lowest compatible with use.
- Rotation friction divided between two elements—*effective packing speeds reduced*, wear reduced, life prolonged.
- Packing assembly fast and easy to replace—fits either way, goes in without disconnection of gooseneck or hose.
- ID of swivel bore same as tubing, large gooseneck opening on large radius. Very beneficial when reversing chunks of core out of the hole.

YEARS OF FIELD USE

have proved the superiority of the Guiberson Full-Floating washpipe... have proved that it gives *better* service than claimed.

WRITE OR CALL GUIBERSON FOR DATA, PRICE AND DETAILS

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boost pumps operate automatically on the principle of differential areas. High hydraulic pressures are controlled by regulation of air inlet pressure. The boost pump is also available in a portable power unit (Model S-440) which includes air filter, air regulator, air gage, air lubricator, air shutoff valve, air muffler, pressure gage, and bleedoff valve; all mounted on ½-in. Masonite base. Weighs 45 lb. complete. *Sprague Engineering & Sales Corp.*

IT'S NEW CHECK IT

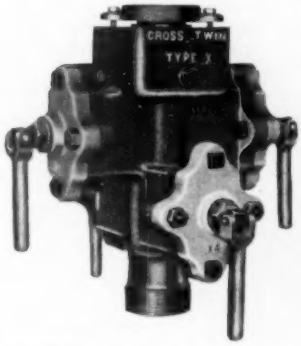
26 NEW SIDE-DOOR CHOKE ASSEMBLY. The new tool has been designed with an extra large flow area around the choke landing nipple, especially for formation-fracturing and other newly developed well-completion and production operations. The Type A assembly consists of a landing nipple mounted concentrically within an outer flow sleeve. A large bypass area around the seating nipple provides a flow course of more than 2 sq. in. for high-pressure and large-volume flow through the tubing. The new choke has a built-in equalizing device to facilitate pulling the tool in the event unbalanced or packed-off pressures prohibit full equalization across the choke. Inasmuch as the seating nipple is made up within the flow sleeve, the same size choke can be run in either a 2 or 2½-in. string. *Otis Pressure Control, Inc.*

IT'S NEW CHECK IT

27 TYPE 4-301 PRESSURE TRANSDUCER. Extremely rapid transient pressure surges and high-frequency pressure pulsations, both frequently encountered in present-day processing equipment and hydraulic control systems, can be easily and accurately measured with this unit. It may also be used for measuring static or slowly varying pressures over an extremely wide temperature range in both gaseous and liquid systems. Due to its extremely rigid construction, high g-loads have negligible effect in any plane. The transducer's output may be either recorded on an oscillograph, when extremely rapid pressure changes must be analyzed in relation to time, or it may be used to indicate pressure changes on meters or oscilloscopes, which can be monitored visually or photographed. Overloads many times its full-scale rated pressure range will not cause mechanical failure. Initial instruments are designed for 10-psig. operation, but later models will be available with full-scale ranges to 5,000 psig. and will be constructed of materials suited to pressure measurements of the highly corrosive fluids frequently encountered in chemical and petrochemical processing. *Consolidated Engineering Corp.*

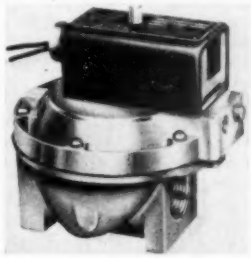
IT'S NEW CHECK IT

28 THE SKINNER TYPE X CROSS TWIN STUFFING BOX is a new improved version of the reliable skinner type "B" Cross Twin stuffing box. The principal change is in the end plate construction which is now tightened with four bolts in place of the original two. A new type gasket material has replaced the sheet-lead type and is performing very well on wells up to 1,500 psi. working pressure. The packing rubber in this box is the same as used in Skinner Type "B" stuffing boxes, and in most instances, with the exception of the end plates, the parts are interchangeable. *Skinner Brothers Co.*



IT'S NEW CHECK IT

29 NEW GAS VALVE. A new diaphragm gas valve that is interchangeable with standard solenoids operates on all gases. Cast aluminum body and housing, larger pilot passageways, and a three-ply diaphragm using a nylon interior sandwiched between buna-N rubber are features that were built into the new valve to minimize servicing. The control is available in a variety of models, sizes, and voltages. The V499 is adapted for a.c. or d.c. line voltage, while the V899 is designed for low a.c. voltage. Both of these are offered in three models, in five sizes ranging from ¾ in. to 2 in. They provide a choice of manual opener, no manual opener, or manual opener with automatic recycling. *Minneapolis-Honeywell Regulator Co.*



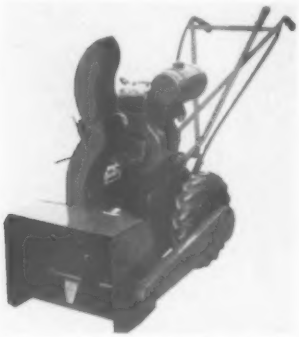
IT'S NEW CHECK IT

30 NIGHT CAP. Installed in the end of the line when job is shut down, the Night Cap keeps out water, mud, rocks, skids, bottles, cans, animals, and all accumulation usually found in unprotected pipe lines. The unit

consists of two light-weight disks and a rubber gasket. A few turns force disk plates together, pressing rubber to form pressure-tight closure. One man can install 30-in. size. Can be vented when necessary to carry away gas or fumes. Because the Night Cap fits inside the line as far back as desired, cutting and beveling can be done in safety and without fear of flashing. *Cleaner Pipelines Co.*

IT'S NEW CHECK IT

31 MODEL 419 SNOW THROWER. Powered with a 4.6-hp. Wisconsin engine this model cuts a path 19 in. wide, has a maximum speed of 160 ft. per minute, and a maximum capacity of 256 sq. ft. per minute. Optional wings will add 6 in. to cutting width. Snow is thrown many feet away so that high banked-up edges are eliminated. Guiding chute is adjustable both for direction of snow throwing and for distance of dispersion. Maximum distance of throw is from 25 to 35 ft. In dry snow it can easily clear depths up to 18 in. Over-all length is 70½ in.; height is 41 ½ in.; and width without optional wings is 21½ in. *The Maxim Silencer Co.*



IT'S NEW CHECK IT

32 WHITE T-I-I GEOPHYSICAL BIT is designed to give the industry an economical yet fast-drilling shot-hole bit. Its body is made of alloy steel and each finger contains a tungsten slug set with hard metal. Short water courses are provided to prevent plugging. Extra-long reaming edges are built in to assure cleaner holes. The entire body is heat treated for maximum wear. With proper subs it will make up to any size connection. *White Bit Co.*

IT'S NEW CHECK IT

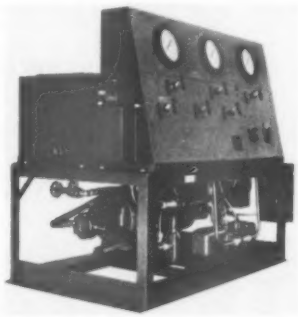
33 SPEEDYLECTRIC HYDRAJET. Ruggedly built to give years of trouble-free, high-speed service, this latest addition to the Livingstone line combines amazing effectiveness with complete freedom from fire and explosion hazards inherent in fuel-fired equipment. Four to eight gallons of scalding hot soap and water per minute at nozzle pressure up to 600 psi. provide, under finger-tip control of the operator, a powerful pulsating hydraulic jet tearing into and under heavy accumulations that defy ordinary cleaning methods. To further accelerate cleaning action, suitable detergents or solvents may be introduced intermittently or continuously in any desired, automatically controlled concentration. Where central plant steam is continuously available, even at low pressure, the Hydrajet can be easily installed requiring only connections to existing steam lines and electric power sufficient for a 3-hp. motor. If central plant steam is not available, a Speedylectric boiler will provide a safe, dependable source of steam at the flick of a switch. *Livingstone Engineering Co.*

IT'S NEW CHECK IT

34 SPECIAL TYPE FISHTAIL BURNERS. According to the manufacturer, natural gas, being a slow-burning fuel, requires a greater percentage of air in the mixture. The additional channels are provided in the design of the N S Burners to accommodate the required air flow to give the desired burning qualities. Tank gas is also slow burning, therefore the N S Burners are ideal for this gas. The N S design can be furnished in the following Fishtail Burner sizes: 228; 81; 420-B; 420-D. *Research Vacuum Supply Co.*

IT'S NEW CHECK IT

35 HIGH-PRESSURE HYDRAULICALLY DRIVEN GAS BOOSTER. This hydraulically driven compressor booster takes bottled gas from 300 to 2,000 psi. and boosts it to any given output pressure up to 12,000 psi. With a 10-hp. motor it delivers approximately 1.5 cu. ft. per minute up to 1,250 psi. over input bottle pressure and approximately .9 cu. ft. per minute from 1,250 psi. up to maximum receiver pressure. This is accomplished by means of a high-low automatic unloading pump system which increases the efficiency of the unit by about one-third over a single pump system. *Haskel Engineering & Supply Co.*



IT'S NEW CHECK IT

36 NEW GATE-VALVE LINE BLIND is extremely simple and rugged. There are no moving parts and its simplicity contributes much to the economical use of the product. The principal action is like that of a gate valve. The gate has sealing rings at each side and is held into a tapered seat by a yoke. A second gate blind may be carried on a fixture attached to the top of the valve stem or it may be carried in a special pocket at the side of the valve. *D. H. Greenwood.*

NATURAL GAS

FPC Swamped

Rules for filing rate-hike applications to be changed

WASHINGTON.—Federal Power Commission rules governing the filing of rate-increase applications by natural-gas companies will be broadened next month.

The dollar amount of increases applied for during the fiscal year, 1952, was about six times greater than filings in 1951 and more than 200 times the 1949 total. This has imposed a heavy burden on the commission, which is seeking to speed up the disposition of such cases.

New rule . . . The commission has announced a proposed new rule (on which interested parties are given until November 21 to submit their views in writing) designed to set forth the requirements for the basic data to be submitted by a company, upon which it relies for support of its rate-increase application.

Principally, the new rule provides for more complete support of the application than under the existing rule and would permit the company to present cost data reflecting known changes becoming effective within 6 months of the last month of available actual experience.

The inclusion of more complete data in the original proposal will facilitate the evaluation of rate-increase applications, the commission said.

El Paso to Buy Gas From Northeast Blanco Acreage

OKLAHOMA CITY, Okla.—El Paso Natural Gas Co. has signed to buy gas produced from an 11,000-acre tract in the Northeast Blanco unit of the San Juan basin, New Mexico, from Blackwood & Nichols, Oklahoma City.

Kenneth E. McAfee, general counsel for Blackwood & Nichols, said starting price under the purchase agreement is 12 cents per M.c.f. beginning January 1, 1954. The price would be raised 1 cent per M.c.f. every 5 years until it reached 15 cents per M.c.f. The 15-cent price would be a minimum from then on, subject to negotiation every 5 years.

Volumes of gas which El Paso will buy were not specified.

The agreement is subject to approval by the Office of Price Stabilization and to approval of the Federal Power Commission of El Paso's planned 100,000,000 cu. ft. expansion of its San Juan-California pipe line.

Blackwood & Nichols have an alternate right under the contract to accept at the 5-year intervals 1 cent less per M.c.f. and to take one-third of the liquids from the gas during the life of the contract. El Paso will maintain and operate an extraction plant to handle the liquids.

The Oklahoma City firm is operator of the 33,000-acre Northeast Blanco unit. The 11,000-acre block is the unit's biggest.

Lone Star Closes Huge Loan

DALLAS.—Lone Star Gas Co. has negotiated a $110,000,000 loan with Prudential Insurance Co. of America to retire outstanding loans and to finance further expansion.

The loan reportedly is the largest ever closed in the Southwest.

Lone Star will use $25,000,000 of the new funds for construction of transmisssion lines and related facilities and for gas exploration and development work.

Natural Gasoline

Storage Gaining

New underground capacity to exceed 3,000,000 bbl.

WASHINGTON. — Underground-storage capacity for liquefied petroleum gas will be increased by nearly 3,800,000 bbl. By the end of next year, giving the country facilities for storing close to 6,000,000 bbl.

A Petroleum Administration for Defense survey, just completed, shows that since this method of storage was first adopted 2 years ago, facilities for storing 2,086,500 bbl. have been constructed and put in operation in 34 projects in seven states.

This capacity was part of a program under which 26 producing companies and L.P.G. distributors will build 77 reservoirs with an aggregate capacity of 5,862,500 bbl. in 12 states.

This year's program . . . Facilities with a total capacity of 3,034,000 bbl. are scheduled for completion by the end of this year, and another 742,000 bbl. will be added in 1953.

PAD reported that 28 projects with a total capacity of 2,935,000 bbl. have been granted priorities assistance, chiefly for the purchase of oil-country tubular goods. In addition, PAD has recommended accelerated tax amortization for 40 per cent of the $7,295,000 cost of 30 projects with an aggregate capacity of 2,830,000 bbl.

More than half of the present L.P.G. underground-storage capacity is in Texas, where 43 projects have provided for 1,056,500 bbl. That state ultimately will have capacity for 3,127,500 bbl. Louisiana, with 415,000 bbl. now, plans a total of 625,000 bbl. New Mexico is planning to increase capacity from 265,000 to 515,000 bbl. Mississippi, with 200,000 bbl. now, and Illinois, with none, plan for 500,000 bbl. each by the end of 1953.

Initial Operations to Begin At Three Bar Field Plant

FORT WORTH.—Stanolind Oil & Gas Co. will begin gas-compression operations soon at the new gasoline plant owned by it and three other companies in Three Bar field, 17 miles southwest of Andrews, Tex.

John R. Evans, division manager of Stanolind in the North Texas-New Mexico area, said the plant will not begin extraction operations until December when processing equipment designed to handle up to 20,000,000 cu. ft. of gas daily will be completed. Gas-compression equipment will handle up to 11,000,000 cu. ft. daily.

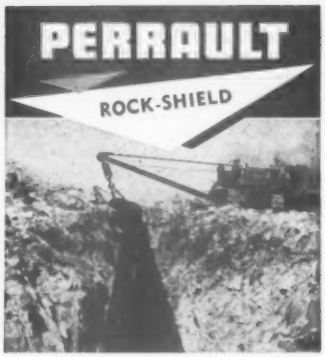
Casing-head gas from the field will reach the plant at 3 psi. and be compressed to absorber pressure of 700 psi. by three 1,320-hp., gas-engine-driven compressors. Residue gas will be compressed to 2,700 psi. for injection.

Process heating will be accomplished through use of direct gas-fired heaters and by circulating hot oil.

In addition to Stanolind, the operator, the plant is owned by Superior Oil Co., Champlin Refining Co., and Humble Oil & Refining Co. The area served by the plant comprises 4,500 acres, with 55 producing wells and three injection wells. Part of Three Bar field, containing production of Stanolind, Superior, and Champlin, was unitized last year. Humble is participating in the gas-injection program, although its properties are not included in the unit.

Prime contractor for plant design and construction is Hudson Engineering Corp., Houston.

C. B. Pierce is Stanolind's field project engineer in charge of construction. Plant superintendent and engineer are G. A. Ayling and G. H. Sanders, respectively.



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PIPE LINES

A.S.A. Approves Safety Code For Natural-Gas Pipe Lines

NEW YORK. — The American Standards Association has approved a safety code for natural-gas pipe lines and distribution systems.

The new Section 8 of the American Standard, Code for Pressure Piping, B31.1-1951, covers material, design, fabrication, installation, testing, and operation.

It was prepared and published separately as a guide in the construction of pipe lines for gas transmission and distribution to meet a current need in connection with construction of cross-country gas pipe lines. The separate publication eliminates the necessity for cross-referencing to other sections of the code.

The new Section 8, technical requirements of which are identical with those in the code, will be included as the last section in future editions of the pressure-piping code.

The new standard has chapters dealing with piping components, pipe joints, fabrications details, and requirements after installation. The final chapter consists of tables and illustrations.

To write the code, the subcommittee reviewed specifications and codes already formulated or in the process of preparation by other agencies and drew upon the resources of the technical groups represented in its membership.

Chairman of the subcommittee is Frederic A. Hough, vice president of Southern Counties Gas Co. of California, Los Angeles. The subcommittee's membership comprises 52 representatives of gas-transmission and gas-distribution companies, pipe companies, valve and fitting firms; independent research groups, technical universities, consulting engineers, and government agencies.

Sponsoring organization for the Section 8 code is the American Society of Mechanical Engineers.

Kaiser to Supply Part of Steel for West Coast Line

OAKLAND, Calif. — Ebasco Services, agent for West Coast Pipeline Co., has negotiated a firm contract with Kaiser Steel Corp. for about 88,000 tons of 24 and 26-in. pipe for West Coast's projected crude trunk from Wink, Tex., to the Los Angeles area. This is about 45 per cent of the pipe needed.

This is the second committment for steel for the West Coast line. Ebasco recently negotiated an agreement with Consolidated Western Steel division of United States Steel Corp., Los Angeles, to supply about 40 per cent of pipe requirements. *(The Oil and Gas Journal, October 13, page 356).*

Both Kaiser and Consolidated said

Ohio Operation

Construction of this 60-mile, 26-in. loop in southern Ohio was completed recently by H. C. Price Co. for Tennessee Gas Transmission Co.

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deliveries will begin the first quarter of next year. Consolidated said that some small quantities may be available for the line during the fourth quarter of this year and that all deliveries would be completed by the third quarter of next year.

Initial capacity of the 1,000-mile line is scheduled to be 200,000 bbl. of crude daily. This latter would be hiked to 300,000 bbl.

Phillips Replacing Product Line From Okmulgee Plant

OKMULGEE, Okla.—Paul Endicott, president of Phillips Petroleum Co., has revealed that Phillips will replace its existing 4-in. products line from here to West Tulsa with a new 6-in. line.

The new line will be relaid through Tulsa to Barnsdall, Okla., where it will connect with the main station of the Great Lakes Pipe Line Co. system.

The bigger line is being placed in service to handle the greater volume of products made possible by completion of Phillips' expansion program at its Okmulgee refinery *(The Oil and Gas Journal, October 20, page 205)*.

Principal units installed during the expansion were an 8,000-bbl. T.C.C. unit, a feed-preparation unit consisting of fired preheater, flash drum, and vacuum still, and a gas-concentration unit.

Columbia Gas Subsidiaries To Lay 280 Miles of Lines

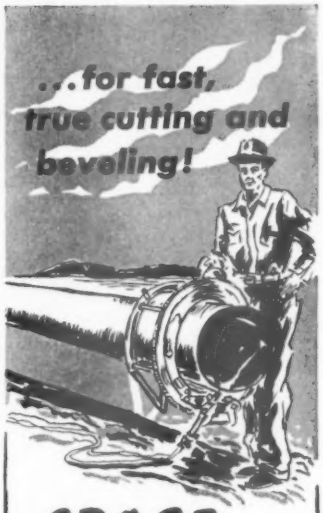
WASHINGTON.—Four eastern gas companies belonging to the Columbia Gas System group are awaiting Federal Power Commission authorization to go ahead with construction of about 280 miles of natural-gas lines in Pennsylvania, West Virginia, Maryland, Ohio, and New York.

They also seek approval of plans to retire 178 miles of lines and certain compressor facilities in the same area.

The four firms are Manufacturers Light & Heat Co., Natural Gas Co. of West Virginia, Cumberland & Allegheny Gas Co., and Home Gas Co., all of Pittsburgh, Pa.

Manufacturers plans to lay a total of about 194 miles of new lines and to retire about 171 miles of line in Pennsylvania, West Virginia, and Ohio at an estimated net cost of $8,250,000. The company also would retire about 440 hp. at a compressor station in Fayette County, Pennsylvania.

Natural Gas Co. of West Virginia would lay about 7½ miles of line and retire about the same amount in Co-



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lumbiana County, Ohio, at an estimated net cost of $77,000.

Cumberland & Allegheny plans to lay 31 miles of lines in Garrett and Allegeny counties, Maryland, and Mineral County, West Virginia, and retire 75 hp. at a compressor station at Preston County, West Virginia, at an estimated net cost of $1,100,000.

Home Gas Co. would lay a 47-mile line in Tioga and Broome counties, New York, and abandon 180 hp. at a station in Broome County. Cost is estimated at $1,700,000.

Coal Interests Fight FPC Approval of Texas-Ohio Line

WASHINGTON. — The National Coal Association was battling vigorously last week to keep the Federal Power Commission from approving plans of Texas-Ohio Gas Co. to build a 1,406-mile gas trunk line from the Mexican border to Ohio.

Tom J. McGrath, counsel for the association, argued at the commission hearing that the company would never be able to build the line unless it could get more gas than it is assured of now.

The company has firm contracts for only a fraction of its daily gas needs, McGrath said. The rest, he said, is covered by letters of intent and commitments from suppliers.

Attorneys for Texas-Ohio insisted that the letters are as binding as contracts.

FPC Rehearing Colorado Interstate Application

WASHINGTON.—A rehearing of Colorado Interstate Gas Co.'s application to construct natural-gas-transmission facilities raising its delivery capacity from the present 368,000,000 cu. ft. daily to 452,000,000 cu. ft. daily gets under way here this week before the Federal Power Commission.

The rehearing is on an FPC order issued February 20 which approved the expansion but qualified the order to prevent Colorado Interstate from adding any new customers or from rendering any additional service to existing customers beyond that shown for certain periods set forth in exhibits.

The rehearing was requested by Colorado Interstate and one of its customer companies, Public Service Co. of Colorado, Denver. Both companies contend that the conditions set forth in the February order adversely affect certain priorities contained in rate schedules and service agreements on file with the commission.

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REFINING

Shell Plans New Platforming Unit at Wood River Plant

WOOD RIVER, Ill.—Shell Oil Co. has announced plans for building a second Platforming unit at its Wood River, Ill., refinery.

The new unit will be similar in size and design to the 16,000-bbl. Platformer now nearing completion at the company's Houston plant.

Wood River's first Platformer, also the first for the company, is a 3,400-bbl. plant placed on stream March 15, 1951. It produces toluene and xylenes.

The Houston unit, which will go on stream near the end of this year, is scheduled to produce over 1,200 bbl. per day of benzene and 2,400 bbl. per day of toluene.

Shell now has still another catalytic reforming unit operating with Platforming catalyst at its Wilmington, Calif., refinery. Originally built to operate on the company's own design, with a different catalyst, the plant went on regular commercial benzene production in March 1950. Previously it had produced 200,000 gal. of benzene on an experimental basis in the spring of 1947 and is believed to have been the first unit of plant scale to convert petroleum fractions to benzene.

This installation recently was converted to a Platformer using the platinum catalyst developed by Universal Oil Products Co. of Chicago. Its output of aromatics averages about 660 bbl. per day.

When the new Wood River unit goes on stream, Shell will have a combined Platformer charging capacity in excess of 37,000 bbl. per day, the largest of any single company.

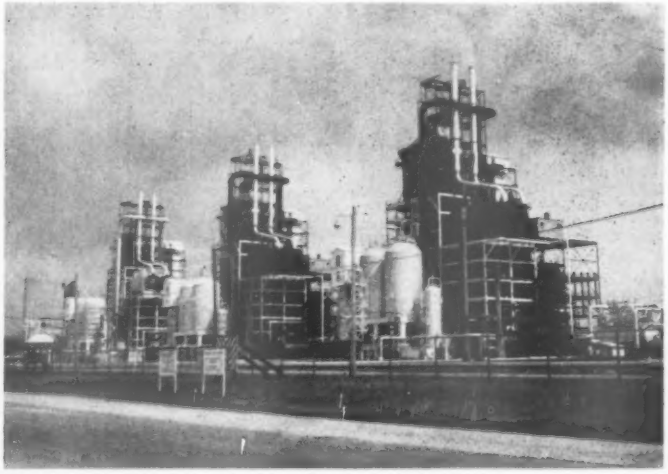
Cities Service Plans Major Expansion at East Chicago

EAST CHICAGO, Ind. — Cities Service Oil Co. (Del.) has revealed plans for a multimillion-dollar expansion of its 35,000-bbl. refinery here.

S. B. Irelan, Cities Service president, said the company will add two major units — a 30,000-bbl. crude-topping plant and a 12,000-bbl. catalytic reforming unit.

The existing delayed-coking units, now reported to have a capacity of 17,500 bbl. daily, will be expanded to about double present capacity.

Contract has been signed with Arthur G. McKee & Co. for construction of the topping unit, according to Lee N. Haugen, Bartlesville, Cities Service vice president in charge of refining. Field construction of the topping unit is



Unique Processing Scheme

The only refinery in the United States to utilize three fluid catalytic cracking units in its processing scheme is the Tutwiler refinery of Cities Service at Lake Charles, La. Virgin heavy gas oil is the feed to one of the units. Feed to the second is deasphalted residuum from one of the topping units and virgin light gas oil. Cycle gas oil and left-over virgin gas oil are fed to the third unit.

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This Socony Air-Lift Catalytic Cracking Unit will give you an outstanding combination of low investment, minimum operating costs, and highest yields of premium quality gasoline and burner oils.

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Among the
Drilling Contractors

Sharp Increase Indicated In Number of Active Rigs

Over-all drilling activity in the United States and western Canada increased sharply during the week ended October 20, boosting the number of operating rotary rigs to the highest level since early last July.

ACTIVE ROTARY RIGS*
(United States and Western Canada)

Area—	Week ended 10-20-52	Change week ended 10-13-52	Change week ended 10-22-51
Gulf Coast	593	+39	− 37
N. & W. Tex.-N.M.	777	+25	−264
Ark.-N. La.-E. Tex.	154	+10	− 27
Oklahoma	313	− 1	− 22
Kansas-Nebraska	171	+20	− 24
Illinois-Eastern	142	−13	− 11
Rocky Mountains	260	+11	+ 59
Pacific Coast	167	0	− 13
Total U. S.	2,577	+91	−339
Western Canada	187	+ 6	+ 20
Total	2,764	+97	−319

*Courtesy of Hughes Tool Co. Trends in drilling activity in the United States and the Gulf Coast and Arkansas-North Louisiana-East Texas areas are shown on pages 184 and 185.

The total of 2,764 rigs reported running that week was 97 greater than during the preceding seven-day period, and was 294 above the number operating 2 months ago, when curtailment of drilling due to pipe shortages had cut the number of operating rigs to the lowest level in more than a year.

Most notable increases in activity during the week were in the Gulf Coast, West Texas, and Kansas areas. In the Rock Mountain region, the number of active rigs was back to its previously set all-time record of 260 rigs.

Dunbar Drilling Co., Salem, Ill., is contractor on a wildcat test which Ray Hose and associates are starting at Burris Dome, in Johnson County, Wyoming. Location is for 2 Government, SW NE SW 31-41n-79e. The Burris Dome prospect is west of the North Meadow Creek field. Hole is projected to the Lakota.

Dixie Drilling Co., Dallas, has taken on a contract for a projected 12,500-ft. test which Richardson & Bass and associates will drill at a wildcat location, 1 Crowell, C NW SW 20-1s-3w, 6½ miles southwest of Glenmora, in Rapides Parish, Louisiana.

M. M. Lindsey Drilling Co., Baton Rouge, La., has a rig running for T. G. Markley in the Napoleonville field, Assumption Parish, coastal Louisiana. Latest operation is 3 Armelise, in 42-12-13e. It is a 5,000-ft. job. **Fortenberry Drilling Co.**, Natchez, Miss., drilling for Pan-Am Southern Corp., also

Day-tour crew on a deep-drilling rotary rig which N. H. Wheless Drilling Co., Shreveport, has running for Shell Oil Co. in Terrebonne Parish, Louisiana Gulf Coast. Left to right: A. B. Cooper, Herbert Moreau, Amos LaJune (driller), Jesse Fall, Earl Hutchison, and Orvis Davidson.

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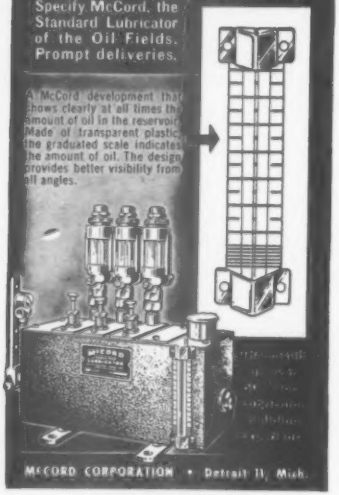

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has a new well under way in the same field at 1 Dugas-LeBlanc, in 46-12s-13e. The latter is projected to 5,900 ft.

Falcon Seaboard Drilling Co., Tulsa, has a rig contracted to Nadel & Gussman for a wildcat test located a half mile west of Fallis, Lincoln County, Oklahoma, at 1 Heller, NE NE SW 30-15n-2e.

Sterling Drilling Co., Sterling, Kans., is starting a Morrison test in southeastern Washington County, northeastern Colorado, on a contract with Plains Exploration Co. The test is being drilled as 1 Bushner. Spot location is in the NW NW SE 11-4n-49w.

Trans-Tex Drilling Co., Longview, Tex., has a rig working for F. R. Jackson and J. M. Deupree at a wildcat location, 1 Roberts, in the John Jackson Survey, 5 miles south of Wills Point, Van Zandt County, East Texas. Contract is for 5,800 ft.

Kidd Williams Drilling Corp., Tulsa, is drilling a partnership test with Pure Oil Co. at 1 Sims, SE SE NE 10-3s-14w, a wildcat located north of Grandfield, Tillman County, southwestern Oklahoma.

Crow Drilling Co., Inc., Shreveport, has a new operation under way in the Bear Creek field, Bienville Parish, northern Louisiana, where it is drilling for Southern Natural Gas Co. The new job is at 2 Cathey, in 32-17n-5w, at the north edge of the field.

Nowery Drilling Co., Shreveport, is drilling for Ohio Oil Co. at 2-P Hodges, a new 6,000-ft. Pettit test in the Cotton Valley field, Webster Parish, northern Louisiana. Location is in 25-22n-10w.

Montgomery Drilling Co., El Dorado, Ark., has contracted with Less & Coyle Co., Dallas, for a 4,000-ft. Tuscaloosa wildcat test to be drilled at 1 Gilford, in 58-18n-13e, just west of Omega, in Madison Parish, Louisiana.

Roeser & Pendleton, Inc., Fort Worth, is doing the drilling at Sun Oil Co.'s ¾-mile outpost test for the Pistol Ridge field, in Forrest County, Mississippi. The test, located in 16-1s-13w, east of the field, is contracted to 9,000 ft.

Melland Drilling Co., Hutchinson, Kans., is moving a rig to southwestern Jewell County, in the extreme northern part of Kansas, where it has a contract for a test to be drilled for Harry Mann at 1 Beard. Location, in the C S½ SW 10-5s-10w, 12 miles southeast of Mankato, county seat, is more than 40 miles from nearest production, the Laton pool.

M & M Drilling Co., Jennings, La., is drilling for Carter Oil Co. at a new operation, 21 Gay Union, being started in the Bayou Choctaw field, Iberville Parish, coastal Louisiana. Location is in 52-9s-11w. Contract is for 8,500 ft.

Clarke Drilling Co., Billings, Mont., has a contract with A. B. Cobb, Jr., for a test to be drilled at East Poplar, in Roosevelt County, Montana. Location is for 1 Macdonald, in the C NW NW 15-29n-50e.

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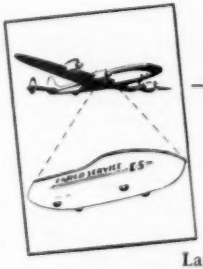

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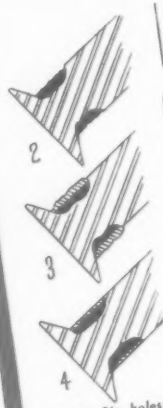

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Interest Rises in North Park Basin

NORTH PARK, a small intermontane basin in North-Central Colorado, may offer a more significant oil province than has been generally recognized.

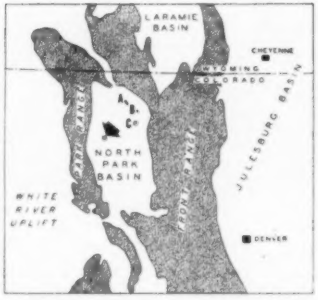
A recent assured discovery has suggested that substantial production may be developed within the Jackson County basin despite an apparently uninviting geological setup.

North Park basin is "intermontane" in the extreme sense of the descriptive term. This 1,500-sq.-mile basin is squeezed between basement-rock mountains on all sides. The floor of the basin is high; ground elevation of the recent discovery is about 8,400 ft. above sea level.

The sedimentary section in the basin may reach a thickness of 14,000 ft., more than 5,000 ft. of which is composed of fresh-water Tertiary beds. Marine Cretaceous shales and sandstones make up the bulk of the rest of the known section. Thin fresh-water Jurassic clastics and Triassic red beds have been mapped on the rims of the basin; and, in the northeastern part of the basin, a thin Pennsylvanian limestone resting on granite has been found. It is not known what Paleozoics, if any, may lie beneath the Pennsylvanian rocks in the deeper parts of the basin.

From a geological point of view, North Park basin would not be considered the most attractive hunting grounds; however, oil has been found within the basin and that's all it takes to eliminate any thinking about why an area should not be considered especially favorable for the generation and accumulation of liquid hydrocarbons. Though there appears to be plenty of structure in the basin, a valid estimate of the ultimate potentialities of the area must await additional drilling.

Prior to this past summer there were but two oil pools in North Park basin: North McCallum and South McCallum, A and B on sketch. These pools were discovered about 25 years ago. The narrow, steepsided McCallum anticlines, each with more than 1,000 ft. of structural closure, are located on a single line of uplift. North McCallum



had 10 producing wells and South McCallum 1 producible well shut-in. Production from these pools, oil accompanied by carbon dioxide gas, had all been from Cretaceous-Dakota sands.

The first indication of revival in North Park basin was when Continental Oil Co., operator of McCallum fields, conducted a seismic survey during the summer of 1951. Last summer Continental opened a Jurassic - Morrison pool at North McCallum. This deeper-pool discovery was completed for 234 bbl. of oil and more than 10 M.M.c.f. of carbon dioxide gas daily. Interest in the basin really began to rise last week when Hiawatha Oil & Gas Co. announced that M. E. Davis (Benedum-Trees) 1 State, D on sketch, had flowed 40°-gravity oil at rates of at least 35 bbl. per hour on a drill-stem test of the Cretaceous-first Frontier. An electric survey showed the sand to be at 6,884-6,908 ft. Carbon dioxide made up less than 5 per cent of the ungaged volume of wet gas accompanying the flow of oil. Casing has been cemented at 6,882 ft. and testing is proceeding.

The discovery was drilled on the Coalmont anticline, a surface-expressed structure. The well is being completed in the first pay encountered because of lost-circulation difficulties experienced; however, interesting possibilities lie beneath the first Frontier sand. About 150 ft. deeper the second Frontier sand should be found and on deeper the thick Dakota-Morrisson section productive at McCallum fields.

Placid Oil Co. is drilling below 6,500 ft. on an 8,000-ft. Morrison test, C on map. It begins to look as though another once-too-remote basin is going to see some activity.

Philip C. Ingalls.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

NEBRASKA . . . Morrill County has been added to the list of producing counties in the state with the completion of G. H. Chizum 1 Hart, SW SW SW 6-18n-49w, for a pump gage of 103 bbl. of oil daily. Ohio Oil Co. has swabbed 123 bbl. of oil cut 6 per cent at 1 Geu, NW NW NW 3-14n-48w, Cheyenne County, and is continuing to test the apparent third Dakota discovery.

MONTANA . . . C. H. Murphy, Jr., 10 Unit, C SW NW 30-29n-51e, wildcat 4 miles northwest of the East Poplar discovery, made 2,306 ft. of oil, plus mud and salt water on test of the zone 5,460-75 ft. with tool open 4 hours and shut in 15 minutes.

WEST TEXAS . . . Fullerton Oil Co. 1 Zorns, reef strike in southeast Terry County, indicated flush production on basis of two drill-stem tests. Amerada Petroleum Corp. 1 Weems, Yoakum County Mississippian discovery, topped the Devonian at 11,682 ft., drilled to 11,742 ft. and prepared to test.

SOUTHEAST NEW MEXICO . . . Cities Service Oil Co. had prospects of a flush Devonian pool at 1-AD State after the well made 2,000 bbl. daily on preliminary tests. Location of the new producer is in the SW SE 22-10s-32e, northeast of the town of Cap Rock and a northeast offset to Jackson, Douglas & Ritchie 1 State, Wolfcamp discovery.

Permian Basin

Midland County Strawn Discovery Completed

MIDLAND.—Plymouth Oil Co. has completed 1-A Foster, 11-41-T2S-T&P, western Midland County, as a flowing Strawn discovery. Location is 3 miles west of the Midland airport. Initial potential was 299.8 bbl. of 47°-gravity oil, based on a 12-hour flow test through ½-in. choke from perforations at 10,570-651 ft.

The well had top of the Strawn lime at 10,555 ft., or minus 7,661 ft. It was drilled to 11,223 ft., in the Bend shale which had some oil shows, then plugged back to 10,800 ft. for completion. Highest flow test reported for the discovery was 320 bbl. of oil in 24 hours, through ½-in. choke, with gas-oil ratio of 1,700 cu. ft.

Fullerton Oil Co. 1 Zorns, Terry County wildcat in 119-T-D&W, had prospects of discovery production in the Canyon reef limestone, or a possible 3-mile southwest extension to the South Brownfield pool. A 2-hour drill-stem test from 9,975-10,007 ft. had gas in 18 minutes and recovered 900 ft. of clean oil. Second test from 10,007-32 ft. had gas in 4 minutes and oil in 22 minutes. It was not allowed to flow and oil in the pipe was reversed out. Operators prepared for completion in the limestone section.

Humble Oil & Refining Co. 4-B Sorrells, on the west side of Diamond M Canyon reef field, in 76-25-H&TC, Scurry County, completed as a new pay discovery in Wolfcamp limestone. Potential was 360 bbl. of 43°-gravity oil a day from perforations at 5,310-35 and 5,410-40 ft.

In northwest Yoakum County, Amerada Petroleum Corp. 1 Weems found top of the Devonian at 11,682 ft. and was drilled to 11,702 ft. where circulation was lost. Elevation is 3,813 ft. This well attracted attention when it flowed 205 bbl. of oil on a drill-stem test in the Mississippian.

On the west side of Jordan field, southern Ector County, Gulf Oil Corp. 9-A Connell had prospects of flush production in the lower Holt (Glorietta), on the basis of a drill-stem test at 4,933-5,005 ft. When mud was displaced with oil, the well kicked off and flowed approximately 50 bbl. hourly through ¾-in. choke. Gas-oil ratio was 594 cu. ft. and gravity was 41°. The well was started on a 7,450-ft. contract to the regular Fusselman pay for that section. Location is 10-B16-PSL Survey.

Magnolia Petroleum Co. 1-CA David Fasken, Andrews County wildcat southeast of Magutex-Ellenburger field, recovered 1,050 ft. of clean, sweet oil on drill-stem test of the Wolfcamp lime from 9,999-10,028 ft. A core to 10,058 ft. recovered limestone with further shows of oil and another drill-stem test was under way.

Northwest of Magutex field, Phillips Petroleum Co. 1-CC University flowed 124 bbl. of oil and 186 bbl. of salt water in 9 hours, and died, from the Ellenburger at 13,918-46 ft.

WEST TEXAS (DISTRICTS 7-C AND 8) SUCCESSFUL WILDCATS

Andrews County: Anderson-Prichard Oil Corp. 1 Fasken, 24-42-T1N-G&MMB&A, W side of shallow Midland Farms field, TD 12,795 ft., elev. 3,057 ft., Ellenberger pay 12,672 ft., IP 675 bbl. 49°-gravity oil, ⅜-in. choke, TP 600 psi., GOR 560 cu. ft.

Coke County: Marloe Oil Co. 1 Copeland, 282-1A-H&TC, TD 6,466 ft., pay 6,400 ft., IP 95 bbl. 48°-gravity oil, ¾-in. choke, TP 50 psi., GOR 1,530 ft.

WEST TEXAS (DISTRICTS 7-C AND 8) WILDCAT FAILURES

Andrews County: Buffalo Oil Co. 1-A University,. 3-1-University Lands, dry, TD 5,014 ft., elev. 3,147 ft., Grayburg 4,520 ft.

Culberson County: El Paso Natural Gas Co. 1 Grisham-Hunter, 35-54-PSL, dry, TD 10,577 ft., elev. 3,431 ft., Wolfcamp 7,046 ft., Devonian 10,548 ft.

Edwards County: The Texas Co. 1 J. E. Phillips, Sec. 4, TCRR Sec. Sur., dry, TD 5,312 ft., Bend 4,996 ft., Ellenburger 5,096 ft.

Martin County: Rycade Oil Corp. 1 M. J. Stimson Jr., 26-38-T1N-T&P, dry, TD 4,355 ft.

Mitchell County: Scurlock Oil Co. 1 W. R. Powell, 83-27-T&&P, dry, TD 7,660 ft., elev. 2,107 ft., Strawn 7,429 ft., Ellenburger 7,560 ft.

Reagan County: Continental Oil Co. 1-A University, 16-7-University, dry, TD 9,383 ft., elev. 2,859 ft., Strawn 8,468 ft., Devonian 8,510 ft., Fusselman 8,710 ft.

Schleicher County: The Pure Oil Co. 1 R. S. Williams, 32-TT-TCRR, dry, TD 8,005 ft., elev. 2,440 ft., Strawn reef 7,428 ft., Ellenburger 7,470 ft.

Runnels County: Estill Heyserd & Claude Heard 1 Poe, 68-63-H&TB, dry, TD 4,641 ft.

H. A. Horwitz Oil Co. 1 Wesley Wood-T. J. Williamson Sur. 530, dry, TD 3,490 ft.

W. M. Peyton Estate 1 D. J. Goetz, J. C. McKean Sur. 534, dry, TD 4,465 ft.

Sutton County: Continental Oil Co. 2 So. Mayer, Sec. 4, McMullen CSL, dry, TD 9,852 ft., elev. 2,127 ft., Strawn 7,843 ft., Ellenburger 8,357 ft.

Tom Green County: Cities Service Oil Co. 1 Washington, Lge. 106, Washington CSL, dry, TD 6,077 ft.

The Texas Co. 1 Rose Gandy, Friedrich Dencker Sur., dry, TD 496 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURES

Briscoe County: H. L. Hunt 10 Ritchie, 74-G6-A&B, 15 miles NE Silverton, dry, TD 8,164 ft., elev. 2,411 ft., Wolfcamp lime 4,020 ft., Cisco 5,040 ft., Canyon 5,630 ft., Strawn 6,140 ft., Mississippian 7,100 ft., pre-Cambrian 7,880 ft.

Hartley County: Bridwell Oil Co. 2 Houghton, 202-3-SCL, 20 miles W Channing, dry, TD 4,371 ft., elev. 3,922 ft., dolomite 3,167 ft., granite wash 3,568 ft., limestone 3,822 ft.

SOUTHEASTERN NEW MEXICO

Cities Service Oil Co. 1-AD State, 22-10s-32e, northeast offset to the Pennsylvanian discovery of Mescalero field, had discovery production in the Devonian. Drill-stem test from 9,835-60 ft. flowed 329 bbl. of oil in 4 hours, with no water reported. Previous test to 9,885 ft. had water in the bottom of the drill stem.

Amerada Petroleum Corp. 1 Axvig, 34-16s-38e, gaged 1,320 bbl. of oil a day from open hole at 12,440-565 ft., to extend Knowles Devonian field ½ mile west. Amerada staked a northwest offset as the 1 W. W. Hammon.

Skelly Oil Co. made location for 1-R Mexico-State 2 miles southwest of Townsend Wolfcamp field. The new well was projected to 14,700 ft. to test the Ellenburger. Location is 18-16s-35e.

Sun Oil Co. 1 Harper-Federal, Delaware basin wildcat in 26-25s-35e, was drilling out cement after running casing to bottom at 11,691 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Eddy County: Martin Yates 1 Belle McCord, 22-23s-26e, dry, TD 2,075 ft.

Lea County: Lawton Oil Co. 3 State, 16-15s-33e, dry, TD 13,140 ft., elev. 4,202 ft., Permo-Pennsylvanian 9,240 ft., Mississippian chert 13,057 ft.

Texas Gulf Coast

New Pay Extends South Lucky Field Production

HOUSTON.—Commercial Petroleum & Transport Co. has completed 1 Marcus D. Huebner as a new pay discovery to extend oil production in South Lucky field of Matagorda County approximately 1 mile to the southwest. Through perforations at 9,435-45 ft. on 3-hour test, well flowed 25 per cent oil and 10 per cent wash water on 10/64-in. choke under pressure on tubing of 750 psi. Well is presently making 110 bbl. of fluid per day with 5 per cent salt water on ⅛-in. choke, tubing pressure of 650 psi. Gravity of the oil was measured at 24.6°. Hole was drilled to 9,537 ft. and 5½-in. production string cemented at 9,530 ft. for completion attempt. The apparent discovery is on the Peter Bertrand Survey, A-5, 3 miles southwest of Bay City.

Sohio Petroleum Co. has established a new fault segment in the South Decker's Prairie area of Harris and Montgomery County with completion of 1 Martin Brautigam, also extending oil production 2,850 ft. southward over the county line into Harris County. On the basis of the structural position of 1 Brautigam and the subsea depth of the base of the completion perforations, being 14 ft. below the established Brautigam Sandwater level in South Decker's Prairie field, it is apparent that the well is in a separate fault segment from the wells in the field. Firm has designated the new area as Decker's Prairie-South Segment "A," and has applied for a new discovery allowable. Well, drilled to a total depth of 5,752 ft., is located approximately 4½ miles west-northwest of Tomball on the J. H. Edwards Survey, A-20.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Brazoria County: The Texas Co. C-1 T. F. Smith, Jr., C. P. Patton Sur., A-337, dry, TD 3,396 ft.

Calhoun County: Sun Oil Co. 82-3 San Antonio State, 25 miles NE of Rockport, dry, TD 8,970 ft.

Fayette County: Cable Tool Drilling Co., Delta Drilling Co. and B. G. Byars 1 Otto Witt, Wm. Rabb Sur., A-86, dry, TD 3,814 ft.

Hamman Oil & Gas Co. 3 Otto Steinhauser, E. S. Powell Sur., A-267, dry, TD 2,444 ft.

Goliad County: Geo. H. Coates 1 Sophie Heller, H. C. Kitchen Sur., A-174, dry, TD 4,102 ft.

McKenzie Bros. 1 Clara Lucas Cartwright, Juan M. Delgado Sur., dry, TD 4,300 ft.

Live Oak County: Guin Drilling Co. 1 Sam R. Knight, J. R. Johnson Sur., A-263, dry, TD 4,006 ft.

Refugio County: Hassie Hunt Trust Est. 1 Kathleen D. Roche, John Patrick Thomas and James Downey Sur., dry, TD 8,250 ft.

Union Producing Co. 8 Tatton, E. W. Best Sur., A-80, dry, TD 8,504 ft.

Wharton County: Ft. Bend Oil Co. 1 John M. Moore Est., Geo. Huff Sur., A-30, dry, TD 6,912 ft.

California

Kern Wildcat Finaled as Pumper in Lower Stevens

LOS ANGELES.—Standard Oil Co. of California's wildcat about ¾ mile northwest of Bellevue field, Kern County, was being completed as a pumper in a lower Stevens sand after a deeper zone proved wet. The extensioner, 53 Karpe in SW NE 34-29s-26e, had found the upper Stevens gray.

Drilled to 9,466 ft., 7-in. casing was set at 9,110 ft. When perforated at 8,995-9,035 ft., only mud and water was swabbed. Casing then was perforated at 8,780-8,810 ft. and after continued swabbing clean oil was recovered with the fluid level standing at 600 ft.

On the west edge of Midway field, Oceanic Oil Co. 1 General American was in process of being completed as a new discovery in the Republic sand. A pumper, the well found the new zone at 4,313-29 ft. Its location is in SE 16-32s-23e.

A test which will be very closely watched shortly will get under way 2½ miles southwest of Wheeler Ridge-Eocene production. To be drilled by Richfield Oil Corp., 1 San Emidio-B will be located in SW 36-11n-21w.

At the southeast offset to the discovery, Richfield was drilling below 11,147 ft. after having set pipe at 9,892 ft. on top of the Eocene sand. About ½ mile east, in NW SE 28-11n-20w, Standard of California 356 K.C.L.-2 was reported drilled below 10,100 ft. Still further east, in SE SW Sec. 27, its 337 K.C.L.-2 was drilling below 7,800 ft.

The search for gas in the Sacramento Valley was being continued with unsuccessful tests being offset by new wildcats. In the Marysville-Buttes area of Sutter County, Richfield abandoned its 4 Buttes Community-B and staked a new wildcat. The dry hole, a ½-mile northeast step-out to the discovery in 8-15n-2e, was abandoned at 3,345 ft. The new test, 1 Sutter Community-A, will be about 5 miles northeast in 22-16n-2e.

A new Sacramento County wildcat will be Amerada Petroleum Corp. 2 Upham, in 23-3n-2e or 1½ miles southwest of Rio Vista gas production. Approximately 2 miles southeast of its recent gas discovery at Freeport, California Standard was preparing to start 1 Shepard. Its 1 Corriea in 24-7n-4e, about 1½ miles west of the 6,000-ft. discovery, was abandoned after drilling to 7,490 ft.

The Carrizo Plains area between San Joaquin and Cuyama valleys, where approximately 40 exploratory wells have ended as failures in the past four years, will receive a new 10,000-ft. test. Drilled by Sunray Oil Corp. and General Petroleum Corp., with the former as operator, 63-5 G.P.-Wreden was being prepared in SW NE 5-29s-18e. The two companies hold about 25,000 acres of leases in the vicinity of the new test, which is about ½ mile southeast of a 6,655-ft. failure drilled by Union Oil Co. in 1949.

CALIFORNIA WILDCAT FAILURES

Kern County, Arvin area: Havenstrite Oil Co. 2 Richards, 22-31s-19e, dry, TD 7,033 ft., elev. 466 ft.

Belridge area: Standard Oil Co. 48-7x "well," 7-29s-22e, dry, TD 5,550 ft., elev. 474 ft.

South Pyramid Hills area: G. Graham 4 Graham, 23-25s-18e, dry, Escudo 1,145 ft., TD 1,249 ft., elev. 735 ft.

Wheeler Ridge area: Signal Oil & Gas Co. 2 Signal-Intex-KCL, 2-10n-20w, dry, TD 4,012 ft., elev. 1,361 ft.

Orange County, West Newport area: Canon Drilling Co. 1 Farnsworth, 12-6s-11w, dry, TD 5,660 ft., elev. 16 ft.

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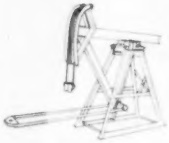

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San Luis Obispo County, Giffard area: Shell Oil Co. 1 Shell-Humble-Arnold US, 34-32s-18e, dry, TD 1,768 ft., elev. 1,501 ft.

Sutter County, Marysville area: Richfield Oil Corp. 4 Butte Comm. B, 8-15n-2e, dry, TD 3,345 ft., elev. 171 ft.

Tulare County, Trico area: Shell Oil Co. 31X-8 R.B.M., 8-24s-23e, dry, TD 12,692 ft., elev. 220 ft.

Ventura County, Santa Paula Canyon area: G. & S. Exploration Co. 1 G. & S., 27-4n-21w, dry, TD 1,789 ft., elev. 773 ft.

CALIFORNIA SUCCESSFUL WILDCAT

Kern County, new zone discovery in Tejon Hills field: D. K. Partnership 2, 183-29 Corrall, SE NE 29-11n-18w, pumped 76 bbl. per day through perforations at 2,207-40 ft., 32.7° gravity, 14/64-in. bean, TD 2,460 ft., elev. 858 ft.

Mississippi

Operators Running Test At Jones County Wildcat

JACKSON.—In Jones County, Mississippi, Gulf Refining Co. completed running 7-in. casing to 13,091 ft. in its Jones County, Sandersville prospect, Section 16-9n-10w and drilled out to 13,097 ft., at which point coring was resumed. The interval 13,097-112 ft. was cored with recovery being 13 ft. of sandstone and shale with pale yellow fluorescence. The next core, 13,113-126 ft. was 9-ft. of dark gray to white anhydrite and shale. In this series of cores, the third core, 13,127-151 ft. was 3½-ft. of gray to white anhydrite with the bottom 6-in. being clear salt. The last core was from 13,151-161 ft. with recovery being 3½-ft. of clear salt. Operator is currently running a drill-stem test from 13,097-112 ft. to test slight show in core from this interval. Total depth of well is 13,161 ft. in salt and operator plans to plug back and test intervals which had shows of oil above this depth.

In Wayne County, Mississippi, approximately 2 miles north of production in Yellow Creek field, the Daws-Stanley-Cashion 1 Eddie G. Creagh, Sec. 19-10n-7w, has been completed as a new discovery for Wayne County in the Morrison sand. On a 24-hour gage the well pumped 105 bbl. of oil, 8/10 of 1 per cent BS&W with gravity being 19° API.

In Wilkinson County, Mississippi, Serio-Germany 1 Thaddeus Leak, Section 30-5n-2w, possible new Wilcox discovery, is making preparations to test after running 5½ in. casing to 6,730 ft. Shows of oil were encountered in Walker sand at 6,551-53 and in the Minter sand at 6,704-06 ft. with the better sand development being in the Walker sand zone.

MISSISSIPPI SUCCESSFUL WILDCAT

Wayne County: Daws-Stanley-Cashion 1 Eddie G. Creagh, Sec. 19-10n-7w, TD 5,214 ft., IP 105 bbl. of 19°-gravity oil, per day, perf. 4,736-46 ft.

MISSISSIPPI WILDCAT FAILURES

Adams County: J. D. Reese et al 1 Louella Hamilton et al, Sec. 16-5n-3w, dry, TD 6,862 ft.

Chickasaw County: Union Producing Co. 1 Dinsmore, Sec. 28-12s-3e, dry, TD 4,447 ft.

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South Louisiana

Avoyelles Wildcat Recovers Oil on Drill-Stem Test

NEW ORLEANS.—Seven miles northeast of Marksville townsite, Avoyelles Parish, Kemp Drilling Co. has cemented 7-in. casing at 7,600 ft. on the 1 Fisher. Wildcat, bottomed at 8,500 ft. had logs run to 7,407 and 8,501 ft., after which operator ran a 15-minute open hole drill-stem test with packer set at 7,403-07 ft. Under 3 psi. working pressure on ¼-in. chokes, well recovered water cushion and 860 ft. of 41.6°-gravity oil plus 130 ft. of salt water and mud. Operator is preparing to perforate casing and test. Drill site is located in Section 34-3n-5e.

The California Co., operating out of New Orleans, has set 7-in. casing at 10,843 ft. in its 1 W. D. Jones et al, confirmation test in Calcasieu Parish. Prior to running casing, log was run to 10,850 ft., but results have not been reported. Operator is now drilling ahead at 10,889 ft. in shale. Well is located in Section 18-9s-7w.

With a flow of 135 bbl. of 50.4°-gravity distillate plus 8,827,000 cu. ft. of gas daily on 22/64-in. choke, Superior Oil Co. has confirmed production in the Deep Lake area, Cameron Parish, at its 2 Rockefeller-State Lease 2038. Test, completed under 3,750 psi. tubing pressure with gas-oil ratio 65,385:1, flowed through perforations from 10,974-984 ft. Bottomed at 13,998 ft., well has 9⅝-in. casing set at 11,995 ft. and 2-in. tubing swung at 10,912 ft. Located in Section 3-16s-3w, well is approximately 1 mile due west of the operators discovery well, 1 Rockefeller-State Lease 2038, located in Section 4.

Austral Oil Co. has opened a new pool 7 miles south and east-easterly of Gueydan, Vermilion Parish, with the completion of its 1 Vincent & Welch, Section 12-13s-2w. On

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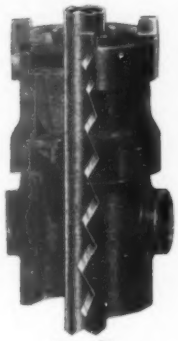

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¼-in. chokes, discovery flowed 88 bbl of 47.5°-gravity distillate plus 4,400,000 cu. ft. of gas daily. Flowing through perforations at 11,797-804 ft., well registered 2,900 psi. tubing pressure with shut-in pressure of 4,260 psi. Gas-oil ratio was 50,000:1. Bottomed at 13,803 ft., well has 7-in. casing cemented at 11,207 ft. and 2-in. tubing set at 11,074 ft.

SOUTH LOUISIANA WILDCAT FAILURES

Avoyelles Parish: Bates & Cornell 1 Geo. G. Snowden, Jr. et al, Sec. 22-3n-5e, dry, TD 8,000 ft.

Lafourche Parish: F. A. Callery 1 Delta Sec. Co., Inc., Sec. 53-18s-19e, dry, TD 10,041 ft.

North-Central Texas

Jones County Strawn Discovery Completed

WICHITA FALLS.—Great Lakes Carbon Corp. 1 Delia O. Gill, James County Strawn sand discovery, has been completed for a daily flowing potential of 460 bbl. of oil. Completion was through ¼-in. choke on perforations at 4,634-44 ft. Location is 5 miles southwest of Anson and 2½ miles east of East Bartlett field.

In Montague County, Miami Operating Co. completed 1 J. R. Blevins as a conglomerate discovery. Initial potential through 20/64-in. choke, from perforations at 5,665-70 ft. was 414 bbl. of 28°-gravity oil in 18 hours. Location in the T. G. Timmons Survey is 2½ miles north of Milan conglomerate field.

A new conglomerate area 2 miles southeast of Nocona has been opened by Jack Grace Production Co. at 1 C. McCall which had an initial production of 154 bbl. of 41°-gravity oil through 14/64-in. choke. Pay was open hole from 5,899-5,907 ft.

Jack Grace made location for a new wildcat 3 miles southwest of Stoneburg, to be drilled as the 1 G. M. Rucker, to 6,400 ft. Location is in Section 27, Jack CSL Survey.

Elm Oil Co. will drill two semi-wildcats in Montague County, both projected to 6,300 ft. Their 1 Pollard was located in the J. H. Stephens Survey, A-1,193 and the 2 Pollard was located in the Ira Yates Survey, A-886, and the Yates and Stephens surveys division lines. The two locations are about 2 miles northeast of Montague.

In Throckmorton County, Pan American Production Co. has scheeduled 1-B J. B. Matthews as a 6,500-ft. wildcat, to be located in Section 112, CIR Survey, 7½ miles southwest of Throckmorton. Nearest production is Gentry-Mississippian field, 4 miles southwest.

Kay Kimbell and L. O. McMillan have announced location for a 7,500-ft. wildcat in northeast Cook County, 4 miles northeast of Callisburg and 3 miles southeast of the Walnut Bend multiple-pay field. The venture is the 1 H. H. Williams, in the Edward Erwin Survey, A-520.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Archer County: L. T. Burns 1 E. A. Jeutsch, 10-A1010-H&TC, 6 miles SE Wichita Falls, TD 5,637 ft., pay 4,555 ft., IP pumped 127 bbl. 42°-gravity oil.

S. D. Johnson 1 C. L. Abercrombie, Clark & Plumb Subd., TD 4,488 ft., pay 4,467 ft., IP 132 bbl. 43°-gravity oil, ¼-in. choke, TP 150 psi., GOR 560 cu. ft.

Callahan County: Sam C. Dunn 1 J. M. Hooks, Sec. 56, G. W. Riley Sur., TD

1,617 ft., elev. estimated 1,700 ft., pay 1,605 ft., IP 6.5 bbl. 38°-gravity oil.

Cooke County: C. J. Simpson Drilling Co. 1 John Rivoire, G. H. & J. E. Howard Sur., A-1386, TD 3,755 ft., elev. 817 ft., Strawn sand pay 3,746 ft., IP pumped 127 bbl. 27°-gravity oil.

Eastland County: Woodson Oil Co. 1 Riley Van Hall, Blk. 2, H&TC, TD 3,589 ft., pay 3,580 ft., IP pumped 88.5 bbl. 40°-gravity oil.

Jones County: Onyx Oil Co. 1 E. M. Blankenship, Sec. 206, A. Wagner Sur., TP 3,120 ft., pay 3,044 ft., IP 101 bbl. 44°-gravity oil, TP 40 psi., GOR 781 cu. ft.

Ungren & Frazier 2 Jane Hoyt, 20-15-T&P, TD 2,227 ft., pay 2,217 ft., IP pumped 72 bbl. 37°-gravity oil.

Taylor County: Geochemical Surveys, Inc. 1 J. B. Crain, 26-148-Grimes CSL, TD 2,342 ft., elev. 1,853 ft., pay 2,267 ft., IP pumped 120 bbl. 41°-gravity oil, GOR 150 cu. ft.

Miami Operating Co. 5 Bill Graham, Sec. 458, Jackson Davis Sur., TD 2,837 ft., elev. 1,937 ft., pay 2,796 ft., IP pumped 78 bbl. 42°-gravity oil.

Wichita County: Henry Grace Production Co. 4 N. R. Temple, Blk. 13, Cowherd Subd., Palo Pinto CSL, TD 1,306 ft., pay 1,276 ft., IP pumped 26 bbl. 39°-gravity oil.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: W. F. Bockhoff 1 Anderson, J. S. Brooks Sur., A-17, dry, TD 1,865 ft.

Bolin Oil Co. 5-C Virgil Seay, Blk. 110, J. W. Harris Subd., dry, TD 1,400 ft., Thomas sand 1,208-35 ft.

Bolin Oil 6-C Seay, Blk. 110, Harris Subd., dry, TD 1,395 ft., Thomas sand 1,185 ft.

P. C. Burns 1 T. B. Wilson, H. H. Kirk Sur., A-249, dry, TD 1,686 ft.

Henry Grace Production Co. 1 G. A. Lauster, Sec. 2, SPRR Sur., A-1237, dry, TD 1,341 ft.

Harold Shappell 1 Birdwell, Blk. 2418, TE&L Sur., dry, TD 1,415 ft.

The Texas Co. 1-B Edwards, Hunt Subd., George Bruner Sur., A-8, dry, TD 5,826 ft.

Young & Shappell 1 Walsh, Blk. 2,416, TE&L Sur., dry, TD 1,412 ft.

Baylor County: The Texas Co. 1-A Waggoner, Sec. 81, T&NO, dry, TD 5,853 ft.

Brown County: Trans-Texas Exploration Co. 1 Armstrong, H&GN Sur., dry, TD 700 ft.

Callahan County: J. W. Marshall 1 M. R. Surles, Sec. 3,157, TE&L Sur., dry, TD 405 ft.

Coleman County: Horace White 2 J. C. Fuller, Sec. 656, Crocheron SSur., dry, TD 1,869 ft.

Cooke County: T. P. Frost 1 W. E. Lemons, J. C. Dickson Sur., A-319, dry, TD 1,785 ft.

C. J. Simpson Drilling Co. 2 John Rivoire, SA&MG Sur., A-974, dry, TD 4,098 ft.

Sussex Oil Co. 1 J. H. Embry, E. A. Williams Sur., A-111, dry, TD 287 ft.

Otho V. Yock 1 Wm. F. Fleitman, Lindsay Ranch Lands, Goodman Sur., A-426, dry, TD 2,160 ft.

Denton County: D. H. Bolin 1 R. H. Godfrey, BB&C Sur., A-184, dry, TD 2,444 ft., Marble Falls 2,092 ft.

Eastland County: Gilchrist Drilling Co. 1 F. K. Moseley, John B. Foster Sur., dry, TD 872 ft.

Haskell County: Rowan & Hope 1 Ida B. Thomas, 11-14-H&TC, dry, TD 5,885 ft., elev. 1,609 ft., Judd sand 5,008 ft., conglomerate 5,885 ft.

Jack County: Glen W. Cooper 1 D. D. Gillespie, W. W. Brown Sur., A-2,904, dry, TD 509 ft.

S. D. Johnson 2 J. E. Garrett, M. Putnam Sur., A-465, dry, TD 3,206 ft.

Franklin Love & Co. 1-B T. D. Williams, J. W. Reasoner Sur., A-502, dry, TD 2,750 ft.

Jones County: L. N. Childress and R. S. Dew 1 J. A. McKeever, Sec. 55, OAL Sur., dry, TD 4,856 ft., elev. 1,739 ft., Hope 2,782 ft., Strawn sand 4,850 ft.

Bert Fields 1 A. W. Hampton, Blk. 204, John McKissack Sur., dry, TD 3,105 ft.

Texas Ice & Refining Co. 1 Adamson, 336-8-McMullen & McGlorin Sur., dry, TD 3,408 ft.

Knox County: Frank Wood Associates 1 D. H. Henry, 44-2-D&WRR, dry, TD 5,847 ft.

Shackelford County: C. B. Christie 1-A C. A. Nail, Sec. 108, ETRR Sur., dry, TD 1,336 ft.

West Central Drilling Co. 1 J. H. Nail, Sec. 127, ETRR, dry, TD 1,530 ft.

Stonewall County: DeSoto Oil Co. 1 Alice Daniels, 392-D-H&TC, dry, TD 6,800 ft.

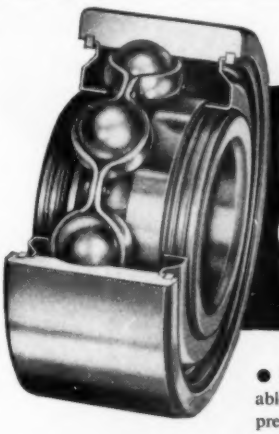
Throckmorton County: G. E. Kadane & Sons 1 J. L. Carpenter, Sec. 1,631, TE&L, dry, TD 4,870 ft., elev. 1,409 ft., Caddo 4,257 ft., Mississippian 4,805 ft.

Wichita County: Fortex Oil Co. 1 J. Jerme, Henry Hastie Sur., A-98, dry, TD 1,347 ft.

Wilbarger County: J. J. Lynn 1 J. Streit, 18-9-H&TC, dry, TD 3,000 ft.

The Texas Co. 1 C. Bildstein, 9-9-H&TC, dry, TD 5,010 ft.

Frank Wood 1 W. T. Waggoner, 35-3-H&TC, dry, TD 2,555 ft.



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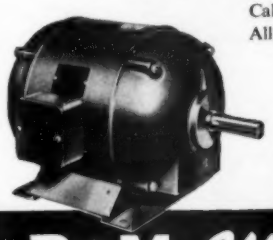

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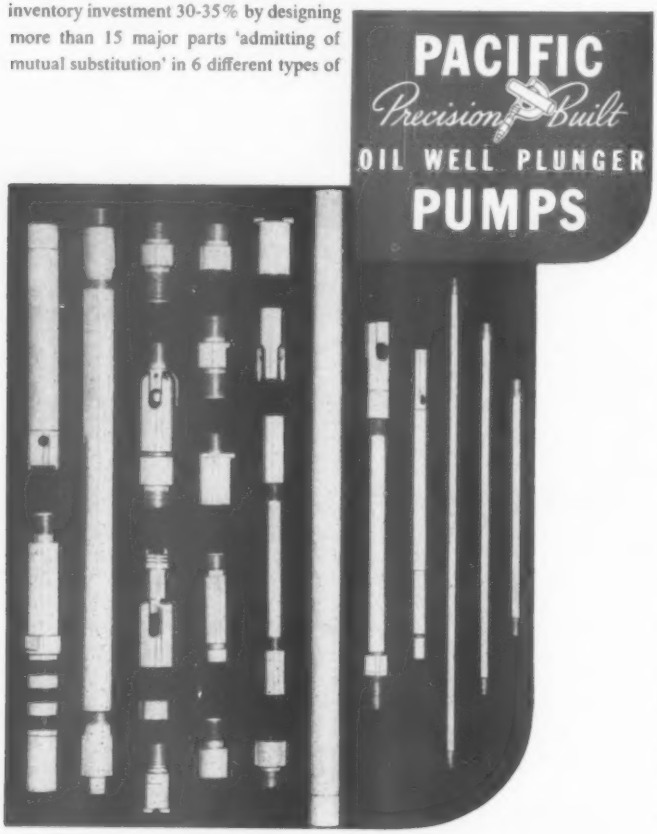

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Southwest Texas

Starr County Reports Rosenburg Discoveries

CORPUS CHRISTI.—Bright and Schiff has made two discoveries in Starr County, approximately 5 miles southwest of Mirando City, north extension to Gutierrez field. The 2 discoveries were drilled on the Mrs. T. E. Puckett Survey 770, and were completed through open hole in a section of Rosenburg sand. The 1-A J. O. Walker was completed through open hole at 1,678-90 ft., and potential an estimated 90 bbl. of oil per day. Operations topped the Rosenburg sand section at 1,678 ft. Bottom of hole is recorded at 1,690 ft., 5½-in. production casing is set at 1,677 ft., 2-in. tubing is set to 1,625 ft.

Second discovery, the 2-A J. O. Walker, was completed through open hole, and potentialed 70 bbl. of oil per day, gas-oil ratio of 295:1. Top of pay in the Rosenburg sand was called at 1,684 ft. Firm set 5½-in. production casing to 1,677 ft., 2-in. tubing was run to 1,670 ft. Pipe line connection for both wells is with Texpata Pipe Line Co.

Humble Oil & Refining Co. has completed the B-56 Paul E. White, Lundell field outpost for initial potential flow of 10.02 bbl. of oil per day on ¼-in. choke. Outpost developed a tubing pressure 480 psi. casing pressure of 540 psi., and flow registered a gas-oil ratio of 57,345:1 with gravity of 22.1°. Drill-stem test taken at 1,541-48 ft. using 3/16 and 1-in. chokes, recovered 25 ft. of salt water, drill-stem test at 2,330-35 ft. using 3/16 and 1-in. chokes under 8½ psi. working pressure, in 20½ minutes recovered 15 ft. of oil. Bottom-hole pressures during test were equalized at 800 psi. Another drill-stem test run at 2,502-14 ft. interval using 3/16 and 1-in. chokes, no pressure, tool open 20½-minutes, recovered salt water. Hole was bottomed to a total depth of 4,201 ft., 5½-in. production casing was set to 2,388 ft., 2-in. tubing was swung at 2,253 ft. Top of pay in the Jackson sand was reported at 2,322 ft. Operations are on the R. E. White Survey 138.

Pure Oil Co. 1 State 285, originally completed as gas well has started making oil and on a 24-hour potential flowed 16 bbl. of pipe line oil per day with tubing pressure of 1,650 psi., with gas-oil ratio of 6,813:1. Original comlpetion was made through perforations shot at 9,463½-507½-ft., and initial potential flow was 9,400,000 cu. ft. of gas per day on open flow, on 8/64-in. choke flow was recorded at 1,165,000 cu. ft. of gas per day with a 3,240 psi. tubing pressure. Hole was bottomed to total depth of 11,850 ft.; however, a whipstock was set and total depth in sidetrack hole was recorded at 9,491 ft. Location is on the Laguna Madre Tract 285.

SOUTHWEST TEXAS (DISTRICT 2 AND 4) WILDCAT FAILURES

Atacosa County: Luling Oil, Texita Oil & Delker 1 Wayne Walton, J. Poitevent 1 Sur., A-965, dry, TD 3,440 ft.

Gonzales County: W. A. Richardson Jr. Trustee 1 William Beuthe, Geo. Gwinn Lge., A-233, dry, TD 6,808 ft.

Guadalupe County: B&S Drilling Co. 2 J. I. Cash Est., Wakefield & Stewart Sur., dry, TD 2,762 ft.

Jim Hogg County: The Chicago Corp. 19 S. K. East, Mrs. Tribble 619, Blk. 3, A-321, dry, TD 3,235 ft.

O. W. Killam 2 Tuben Holbein Sr., Jose Miguel Ramirez, A-1,257, dry, TD 5,416 ft.

Karnes County: Armstrong & Horn 1-A Vin-

cent Lyssey, 11 miles SW of Falls City, dry, TD 4,035 ft.

Milam County: Dalport Oil Co. 1 W. R. Cyrer, Miguel Davila Grant, dry, TD 2,706 ft.

Starr County: Miller & Pierce 1 Mauricia G. Guerra, 3 miles S Guerra field, dry, TD 2,263 ft.

Zapata County: J. C. McCabe et al 2 Cuellar heirs, dry, TD 3,092 ft.

Morris Mizel 1 Herberto Ramirez, 14 miles NE Zapata, dry, TD 2,560 ft.

Canadian Fields

Peace River Area Records Cadotte Gas Strike

CALGARY.—The team of Hudson's Bay Oil & Gas Co., Ltd., Union Oil Co. of California and Pacific Petroleums, Ltd., has discovered natural gas in the Cadotte formation and encountered a small gas flow from the Notekewin horizon at their exploratory driller in the Dunvegan area of northwest Alberta. This strike is in the Peace River region, 260 miles northwest of Edmonton, 50 miles southwest of Peace River town and about that same distance east of the British Columbia border.

The well, Hudson's Bay-Union-Pacific 3 Dunvegan on LSD 5, 19-81-4w6, is about 7 miles northeast of the Hamelin Creek gas well. Three drill-stem tests in the Cadotte gave a total gas flow rate of 3,779,000 cu. ft. daily, and indicated about 35 ft. of pay zone. Initial test, from 1,425-45 ft., with valve open 1 hour, flowed gas at rate 1,776,000 cu. ft. daily. Bottom-hole flowing and closed pressures were 325 psi. Second hour test, from 1,445-55 ft., flowed gas at rate 1,222,000 cu. ft. daily, with same pressures recorded as during first test. Last Cadotte test, from 1,455-65 ft. flowed gas at rate 781,000 cu. ft. daily, with salt water spray in 45 minutes, and 75 minutes recovery of 480 ft. salt water.

One-hour test in the Notekewin formation, from 1,703-40 ft., flowed gas in 4 minutes at rate 280,000 cu. ft. daily. Bottom-hole pressure (closed) was 525 psi. Interval 1,739-60 ft. gave a weak initial blow and recovery of 110 ft. salty water-cut mud.

Imperial Oil, Ltd., and the Tide Water group have indicated oil discovery at their joint wildcat in the Wapella area of southeast Saskatchewan, according to unofficial reports. The strike came at Imperial-Tide Water 9-33 Wapella, an exploratory venture in LSD 9, 33-14-1w2, 28 miles west of the Manitoba border, 45 miles northwest of Virden area oil wells in southwest Manitoba, and 85 miles north of the United States border.

Details of tests run at the Wapella well have not as yet been released, but unofficial reports indicate that a drill-stem test above 2,300 ft. gave up approximately 900 ft. of oil, plus oil-cut mud and salt water. Gravity of the oil is believed to be in excess of 21° A.P.I. Depth indications would place the oil horizon as probably Lower Cretaceous.

CANADIAN WILDCAT FAILURES

Alberta Consolidated 1 Barrhead, LSD 7, 28-60-3w5, TD 3,930 ft.

Bay 6-32 Driedmeat Lake, LSD 6, 32-44-19w4, TD 5,185 ft.

Shell 1 Flat Lake, LSD 10, 25-66-20w4, TD 2,323 ft.

Long Island 1 Glendon, LSD 7, 13-61-9w4, TD 1,708 ft.

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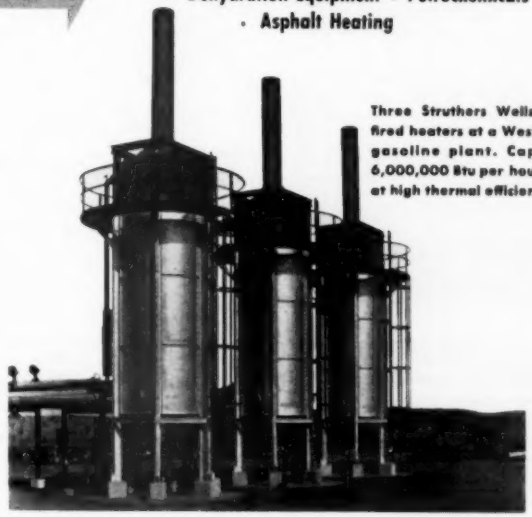

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Anglo 1 Langford, LSD 13, 35-24-7w4, TD 3,311 ft.

Liberal 14-27 St. Paul, LSD 14, 27-56-9w4, TD 2,200 ft.

Maralta & Assoc. 1 Sunnynook, LSD 7, 28-26-14w4, TD 3,824 ft.

Bay-West Canadian 6-2 Watt, LSD 6, 21-31-16w4, TD 3,426 ft.

Eastern Texas

Confirmation Scheduled For New Woodbine Field

DALLAS.—Hunt County's new Woodbine oil field northeast of the town of Cash had a confirmation well scheduled as Floyd C. Ramsey 2 Paul. Location was a long southwest offset to the discovery, in the Mary Latham Survey, A-597. Contract depth was 3,350 ft.

Humble Oil & Refining Co. has scheduled two new operations for East Gossett field of Kaufman County, which currently has two producing wells. Both locations are southwest of the discovery well; the 1 Lewisville Unit was spotted 1,550 ft. from west and 3,350 ft. from north lines of the Felipe Cortez Survey, and the 1 Pickard was spotted 1,070 ft. from west and 3,820 ft. from north lines of the same survey.

Humble also made location for two tests on the east side of the Ham Gossett area, as the 1 G. B. Stockton and the 1 Stockton, both on an 82-acre lease in the Antonio Reys Survey.

Rowan Oil Co. has abandoned 1 B. L. Markum, Tarrant County wildcat 3 miles northwest of Benbrook. Total depth was 7,126 ft. The well recovered gas on drill-stem test at 5,604-34 ft., and flowed at the rate of 1,000,000 cu. ft. a day on a 1-hour test from 7,004-24 ft. Recovery on the latter test included 3,600 ft. of salt water.

EAST TEXAS (DISTRICTS 5 AND 6) SUCCESSFUL WILDCATS

Freestone County: Humble Oil & Refining Co. 1 Fred Marberry, S. P. Flint Sur., ½ mile NE Kirvin, TD 13,595 ft., PB 7,337 ft., elev. 460 ft., perforated Rodessa 6,544-60 ft., IP 5,000,000 cu. ft. gas, plus 1.2 bbl. distillate per 1,000,000 cu. ft., RP 2,685 psi.

Hunt County: Floyd C. Ramsey 1 P. B. Paul, Mary Latham Sur., A-597, 1½ miles E Cash, TD 5,010 ft., elev. 491 ft., perforated Woodbine 3,210-16 ft., IP pumped 44 bbl. 37°-gravity oil.

Leon County: Lone Star Producing Co. 2 Steve Pate, BBB&C Sur., 7 miles SE Buffalo, TD 5,764 ft., elev. 263 ft., Woodbine sand 5,709-13 ft., IP approximately 900,000 cu. ft. of gas.

EAST TEXAS (DISTRICTS 5 AND 6) WILDCAT FAILURES

Cherokee County: Coats Drilling 1 Julia Bolton, Geo. E. Looney Sur., 3 miles NE Maydelle, dry, TD 5,023 ft.

Kaufman County: E. B. Fletcher 1 C. J. Fogelman, E. Higdon Sur., A-197, 1½ miles SE Kemp, dry, TD 4,115 ft. in the Woodbine.

Smith County: Cities Service Oil Co. 2-C, G. G. Wright, J. M. Garcia Sur., A-368, 2 miles SW Crow, dry, TD 6,125 ft.

Louisiana-Ark.

Operators to Test Pettit Porosity at Caddo Well

SHREVEPORT.—Crystal Oil Co. and Muslow et al logged 30 ft. of upper Pettit porosity with oil saturation and will test at 3 Brown, C NW NE 27-20n-16w, Caddo Parish. The test is 1¾ miles northwest of Mooringsport, just south of Caddo Lake. Drilled to 5,662 ft. in Hosston, the well logged Pettit porosity from 5,178-5,208 ft. Hole has been plugged back to 5,220 ft. and completion will be attempted from open hole with 5½-in. pipe set to 5,220 ft.

Carter Oil Co. has announced completion of 1 Crystal, SW NE 33-21n-11w, Bossier Parish wildcat near Ivan. Wildcat flowed 238 bbl. of distillate daily from perforations 9,706-20 ft. in the Taylor sand of the Cotton Valley. The new producer is located 2 miles southwest of nearest production in Cotton Valley field.

Magnolia Petroleum Co. is testing to tanks at their Concordia Parish outpost well to Esperance Point field, the 1 Hugh Junkin, Section 4-5n-9e. The 3,000-ft. outpost well is producing from perforations in Campbell sand at 6,302-06 ft.

Arkansas.—Alcan Oil Co. has cemented production string at 1 Mary Slaughter in the SE SW 14-14s-19w, wildcat about 4 miles east of Troy in Ouachita County. Ten feet of sand with a show of oil from 1,960-70 ft. were cored.

The same company is continuing tests at 2 Calion Lumber Co. in Section 22-15s-14w, a new oil discovery about 3 miles southwest

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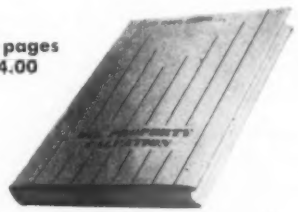

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of Hampton field in southern Calhoun County. The well is pumping 25 bbl. of oil and no salt water daily on the latest test. Production is from perforations at 2,466-70 ft.

LOUISIANA WILDCAT FAILURES

Bienville Parish: M. A. Halsey and Natural Gas & Oil Co. 1 Watley, C SE SE NE 32-16n-8w, dry, TD 7,416 ft.

Caddo Parish: The Texas Co. 1 Williams, C NW SW 2-15n-15w, dry, TD 9,407 ft.

Concordia Parish: Barnett Serio et al 1 Hattisburg Bank & Loan Co., C NW¼ NW¼ 39-4n-8e, dry, TD 7,504 ft.

Barnett Serio et al 3 Angelina Hardwood Lumber Co., C SE NE 33-4n-7e, dry, TD 7,606 ft.

Ouachita Parish: Southern Carbon Co. 1 Louisiana Delta Oil Prod., Inc. "D," 641 ft. S and 1,181 ft. E of NWc 1-19n-4e, dry, TD 11,124 ft.

Union Parish: Barnwell Drilling Co. 1 Facker, 1,650 ft. S and 2,327 ft. E of NWc 23-23n-2e, dry, TD 2,576 ft.

ARKANSAS WILDCAT FAILURE

Miller County: Sinclair Oil & Gas Co. 1 Stafford, 660 ft. S and E NWc NW SE 19-17s-26w, dry, TD 6,472 ft.

Appalachian-Ohio

Good Gas Wells Noted In West Virginia

PITTSBURGH.—In Portland district, Preston County, West Virginia: Cumberland & Allegheny Gas Co. 1-482 Lola Phillips, elevation 2,180 ft., resulted in 3,210,000 cu. ft. gas after acidizing, chert 5,200 ft., Oriskany sand 5,372 ft., gas 5,381 ft., TD 5,501 ft. Baileysville district, Wyoming County, United Producing Co., Inc., 118-1932 W. M. Ritter Lumber Co., gaged 2,214,000 cu. ft. gas in the Berea sand, TD 3,855 ft. Triadelphia district, Logan County, United Producing Co., Inc. 33-1914 Pardee Land Co., tested 1,161,000 cu. ft. gas in the Berea sand, TD 4,489 ft. Anthony Creek district, Greenbrier County, Natural Resources Corp. 1 T. M. Van Buren heirs, elevation 2,122 ft., recorded the Oriskany sand at 1,371-92 ft., and is shut down at 1,479 ft. Union district, Pendleton County, Blaho Oil & Gas Co. 1 James Sites, after a reaming job, is drilling again and is at a depth of 400 ft.

Maryland.—In Garrett County, Maryland, Superior Oil Development Co. 1 Wilt & Jacobs, reached the Oriskany sand at 4,882 ft., and encountered salt water at 4,885 ft. It is shut down at this depth. Columbian Carbon 1-1510 D. Milton Riley reported gas in the chert at 3,639-3,665 ft., testing 1,416,000 cut. ft. Drilling is at 3,690 ft.

Pennsylvania.—Unity Township, Westmoreland County, Southwest Pennsylvania: Peoples Natural Gas Co. 4003 A. J. Dotterway, is drilling at 8,397 ft., and 4008 J. R. Frola, at 6,183 ft. Greenville Township, Somerset County, New York State Natural Gas Corp., is moving in tools at 320 M. V. Newman.

OHIO

Ed Obermiller 1 Charles Marks, Section 1, Tuscarawas Township, Stark County, a wildcat west of the city of Massillon, logged Clinton shell at 4,125-45 ft. with 115,000 cu. ft. gas and Clinton sand at 4,165-4,239 ft. broken and dry. The well was shot with

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40 qts. and the gas increased to 260,000 cu. ft. with a rock pressure of 1,400 psi.

Mt. Zion pool was further extended over into Fallsburg Township, Licking County, with a fair producer on John Rizor, Section 5. The operator, Mid East Oil Co., reported sand at 2,880-2,930 ft., having 5 bbl. natural and 40 bbl. in 24 hours after a 150-qt. shot.

Ohio Fuel Gas 1 Thelma Martin, Lot 22, Litchfield Township, Madina County, found the Clinton at 2,748-55 ft. with 2,260,000 cu. ft. natural.

OHIO SUCCESSFUL WILDCAT

Stark County, Tuscarawas Township: Ed Obermiller et al 1 C. P. Marks, Section 1, Clinton shell 4,125-45 ft., 260,000 cu. ft., TD 4,278 ft.

Rocky Mountain

New Strike Indicated In East Poplar Area

DENVER.—Discoveries were indicated in almost every portion of the Rocky Mountain region this week, with some of the new developments of extreme importance to programs under way in widely separated areas.

An apparent discovery by C. H. Murphy, Jr., in the northwest of previous production in the East Poplar area of Roosevelt County, Montana, greatly broadened the promise of this area, where production was first established about a year ago. Murphy 10 Unit, C SW NW 30-29n-51e, 4 miles northwest of the East Poplar discovery, recovered 2,306 ft. of 40.8°-gravity oil on 4-hour test of the zone 5,460-75 ft. In addition to the oil the recovery included 182 ft. of black mud cut with sulfur water, and 728 ft. of salt water. Formation tops have not been released on the wildcat. The operator is coring below 5,580 ft.

Since the discovery, which produced from two Mississippian zones, with a potential in excess of 600 bbl. daily, a considerable development program has been conducted in the field, and eight producers have been completed over a 2-mile trend extending northeast and southwest.

The current discovery is east of a dry hole completed in the West Poplar area earlier this year by Phillips Petroleum Co., and Carter Oil Co., and is southeast of the Ajax Oil Co. 1 McGowan, which made oil on initial tests, later made salt water, and is still testing.

In Slope County, North Dakota, Deep Rock Oil Corp. reported recovery of additional oil and gas-cut mud as further testing proceeded at 1 Brusich, SE SE SE 8-135n-98w. The operator reported recovery of 3,585 ft. of fluid in 1-hour test of the zone 8,466-8,619 ft. The recovery included 275 ft. of slightly gas-cut mud, 700 ft. highly oil and gas-cut mud, 1,164 ft. of oil and gas-cut muddy water, and 1,446 ft. of gas-cut water. Cores in the interval 8,570-8,609 ft. had good odor in part, with some porosity and shows in lime and dolomite cores. Amsden at 7,270 ft. was the last top reported. This area of North Dakota is the first to report shows of this caliber outside the Nesson anticline area since oil was discovered in the state. The wildcat is about 50 miles east of Shell Oil Co.'s recent discovery in the Little Beaver area of Fallon County, Montana. There has been no previous drilling in this portion of the state.

Possibility of a new discovery for the Five Mile area of Big Horn County, Wyoming, is seen in reports from Husky Oil Co. 1 Government, SE NW SW 12-49n-94w, which is coring in Tensleep below 12,773 ft. Saturation with considerable porosity was reported in cores from the top of this formation. Shows of hydrogen sulfide bearing gas and distillate were logged in the Phosphoria, but this formation was cased off without test when Tensleep possibilities were noted. A successful completion in the lower horizon would relieve the necessity of processing sour gas before the well could be commercially produced. This situation exists in the Five Mile discovery well which was completed in Phosphoria for a gage of about 40 to 50 million cubic feet of sour gas per day with about 50 bbl. of distillate per million. The 1 Government is 3½ miles northwest of the discovery, and indicates a possible large producing acreage for the area.

In the Happy Springs unit, Fremont County, Sinclair Oil & Gas Co. has completed one of the best producers in Wyoming in recent years at 13 Unit, SE SW SW 4-28n-93w. The well was a dual completion, making 1,750 bbl. daily from Dakota from the zone 4,480-4,540 ft., and swabbing 455 bbl. of oil daily from Lakota through perforations 4,560-64 ft. The Lakota production is the first from this formation in the field and establishes the well as a new pay discovery for the area.

Four miles northwest of Duchesne field in Duchesne County, Utah, Carter Oil has the second apparent discovery of the year for the Uinta basin. The company's 1 Joseph Smith, C SE SE 16-3s-5w (USM), recovered 540 ft. of water cushion, 3,080 ft. of oil, and 240 ft. of mud on 2-hour test of the basal Green River from 8,807-57 ft. There was a good blow of gas within 7

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minutes, and the flow was gaged during the test at the rate of 200,000 cu. ft. per day. Flowing pressure was 650-880 psi., shut-in pressure 4,250 psi.

In Jackson County, Colorado, M. E. Davis (Benedum-Trees) has run casing and is preparing to swab at the 1 State, C NW NW 36-7n-81w, in the Coalmont anticline area. The well made oil on an estimated 35-50 bbl. per day rate from Frontier between 6,889-6,920 ft., and is regarded by many observers as one of the most important developments in the state during recent years.

Two other Colorado discoveries were reported during the week. Southern Production Co. is testing at 1 Mott, SW SW SW 23-3n-53w, Washington County, with a gage of 6.5 million cubic feet of gas reported on early tests of the "J" sand in the interval 4,843-58 ft. Tool was open 12 minutes on the test.

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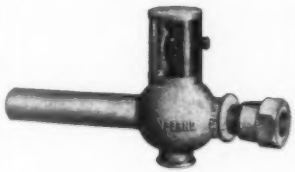

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Also in Washington County, R. L. and J. L. Rush, of Dallas, have recovered 1,350 ft. of free 30°-gravity black oil on drill-stem test of the interval 3,914-59 ft. in "D" sand. The wildcat is on a farmout from Amerada Petroleum Corp. which is being drilled through Washington and Morgan counties, and is the third success in the series. Complete details have not been released and some data has been withheld on the majority of the series. The operator is running for further testing.

In Nebraska G. H. Chizum, Fort Worth independent, has completed the first discovery in Morrill County, the 1 Hart, SW SW SW 6-18n-49w, for a gage of 103 bbl. daily. The wildcat is on land farmed out from the Ohio Oil Co.

WYOMING SUCCESSFUL WILDCATS

Fremont County: Sinclair Oil & Gas Co. 13 Unit, SE SW SW 4-28n-93w, swabbed 455 bbl. oil per day from Lakota, flowed 1,750 bbl. oil per day from Dakota, Lakota discovery, new pay, TD 4,632 ft., PBTD 4,596 ft. Dakota 4,478 ft., Dakota 4,582 ft.

Natrona County: Wind River Oil and Richard King, Jr. 1 O'Connor, NE SE NE 31-38n-80w, flowed 2,500 M.c.f. gas per day from 1st and 2nd Wall Creek, new pay, TD 2,523 ft. 1st Wall Creek 1,928 ft.

WYOMING WILDCAT FAILURES

Goshen County: Ozark Production 1 Langdon, SW SW SW 4-30n-60w, dry, TD 4,176 ft.

Johnson County: R. A. Hose et al 1 Government, SE NW SE 32-42n-79w, dry, TD 1,994 ft.

COLORADO WILDCAT FAILURES

Mesa County: Sam Kubetz 1 Radar, SW NE SE 3-1n-1w (UPM), dry, TD 689 ft.

Moffat County: Moore & Gilmore 1 Seely, NE SE SE 2-5n-95w, dry, TD 3,042 ft.

Weld County: Murphy Corp. and Ashland Oil & Refining Co. 1 State, NE NE SW 26-3n-62w, dry, TD 7,446 ft.

J. P. Sloss 3 Wickland, SE NE NW 22-9n-57w, dry, TD 6,130 ft.

Yuma County: Southern Production Co., Inc. 1 Peter Trautman, NW SW SE 6-3n-48w, dry, TD 4,356 ft.

NEBRASKA SUCCESSFUL WILDCAT

Morrill County: G. H. Chizum 1 Hart, SW SW SW 6-18n-49w, pumped 103 bbl. of oil daily from "J" sand, new field, "J" sand 4,004 ft., TD 4,045 ft.

NEBRASKA WILDCAT FAILURES

Cherry County: Argo Oil Co. 1 Barnes, C SE NE SE 6-30n-33w, dry, TD 4,416 ft.

Cheyenne County: Lario Oil & Gas Co. 1 Niece, NE SW NW 23-16n-47w, dry, TD 4,346 ft.

UTAH WILDCAT FAILURE

Uintah County: Continental Oil Co. 2 Unit, SE 9-14s-21e, dry, TD 4,205 ft.

MONTANA WILDCAT FAILURES

Blaine County: The Texas Co. 1 Miller, NW SE SE 9-37n-18e, dry, TD 6,674 ft.

Carbon County: John Maschera 1 Caldwell, NW NW NW 32-4s-23e, dry, TD 1,200 ft.

Valley County: Gulf Oil Corp. 1 Cornwell, C SW NE 14-30n-38e, dry, TD 7,037 ft.

NORTH DAKOTA WILDCAT FAILURES

Towner County: Frank H. Rhodes-A. L. Langenfeld 1 Murphy, C NW NE 18-163n-65w, dry, TD 3,789 ft.

Williams County: C. L. Williams-O. D. Clark

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Oklahoma

Garvin County Wildcat Uncovers Bromide Pool

CITIES SERVICE OIL CO. has found promising indications of production in Bromide sand at its 1 McCurley, C SW NE 19-3n-1w, a wildcat located 4 miles east of Antioch and a mile southeast of the East Antioch field, in Garvin County. Hole is being deepened to lower potentially productive zones.

Top of the Bromide section was logged at 5,162 ft. The first drill-stem test, taking in an interval at 5,164-5,239 ft., flowed both oil and gas and recovered 2,640 ft. of oil and gas in the breakdown. Gas flow, estimated at 400,000 cu. ft. per day, started within 4 minutes at an estimated rate of 15 bbl. per hour. Another test deeper in the pay at 5,262-92 ft. got gas in 9 minutes and recovered 2,260 ft. of oil. A test still lower in the pay at 5,303-21 ft. got salt water with small amount of slightly oil and gas-cut mud.

Randall Morton 1 Capehart, a wildcat located east of the Roulette Creek field, in southeastern Cleveland County, got a gas and oil flow and recovered 5,600 ft. of oil in a 30-minute drill-stem test at 6,271-79 ft. in second Wilcox sand, topped at 6,269 ft., and now has casing run to the top of the pay. Gas was at the surface in 8 minutes and oil in 22 minutes. Spot location is in the NW SW SE 14-8n-1e.

Promising oil showings also have been encountered in a wildcat being drilled northwest of Tupelo, western Coal County, by Beach & Talbot. The wildcat, 1 Guth, NW SE NW 22-2n-8e, flowed gas in 6½ minutes and oil in 115 minutes during a 2-hour drill-stem test at 6,846-6,910 ft. in Bromide sand, topped at 6,738 ft. Oil also flowed while pipe was being pulled. Staining and odors also were encountered in McLish sand, topped at 7,025 ft. Location is about 5 miles east of the Fitts field, in eastern Pontotoc County.

Mid-Continent Petroleum Corp.'s second producer for its recently opened pool, located northwest of the old, shallow Tipton area, in Jackson County, is proving a much better well than its discovery producer. The new well, 2 Richardson, SW SE SE 30-1n-19w, a location east of 1 Richardson, the discovery well, averaged 17½ bbl. of oil per hour the first 12 hours; 13½ bbl. of oil the next 12 hours; and then flowed 390 bbl. in 26 hours, all through the casing. The discovery well was completed making only 34 bbl. of oil per day on the pump. Pay zone of both wells is the Strawn granite wash, opposite which the new well is perforated at 2,485-89 ft., and the discovery well at 2,395-2,407 ft. and 2,445-55 ft. South offset to the discovery well was dry.

OKLAHOMA SUCCESSFUL WILDCATS

Canadian County: Sinclair Oil & Gas Co. 1 Huchteman, NW NE SE 14-12n-7w, flowed 47 bbl. of distillate, 10,300 M.c.f. of gas daily from 2nd Wilcox at 10,348-398 ft., TD 11,700 ft.

Garvin County: Shell Oil Co. 1 Rose, SE NE SW 6-1n-3w, flowed 288 bbl. of oil per day from 3,647-83 ft., TD 4,973 ft.

OKLAHOMA WILDCAT FAILURES

Beaver County: Sinclair Oil & Gas Co. 1 Barby, C SE NE 21-4n-26eCM, dry, TD 9,545 ft.

Pure Oil Co. 1 Dixon, SE SE NE 20-5n-26eCM, dry, TD 6,996 ft.

Garvin County: Vickers Petroleum Co. and Nichols-Duncan 1 Cole, NW SW NW 8-1n-3w, dry, TD 5,156 ft.

Grant County: Sooner State Oil Co. 1 Early, NE NE SW 17-27n-5w, dry, TD 4,953 ft.

Kay County: Glickman Oil Co. 1 Heagy, SW NW NW 22-27n-3e, dry, TD 3,265 ft.

Marshall County: Ray Ryan 1 Beard, C NE SW 25-5s-5e, dry, TD 6,955 ft.

Okfuskee County: Jones-Shelburne, Inc. 1 Dobbins, SW SE SW 32-12n-8e, dry, TD 3,776 ft.

Okmulgee County: Wolfe Drilling Co. 1 Harrison, SW SE NE 28-14n-15e, dry, TD 2,685 ft.

Osage County: K. A. Ellison 1 Osage, SW SW NE 25-26n-7e, dry, TD 2,681 ft.

Pawnee County: Plateau Development Co. 1

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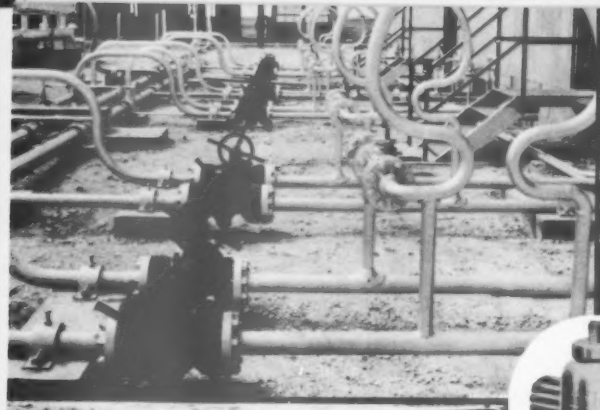

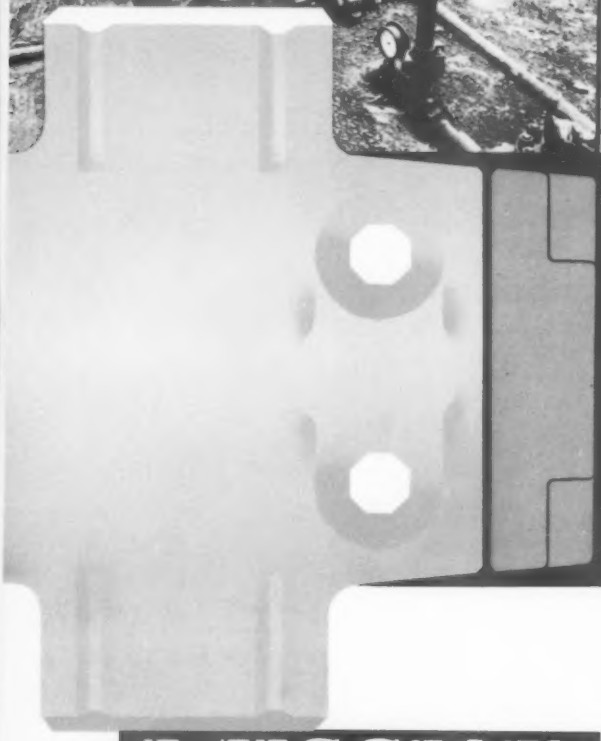

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Pottawatomie County: H. L. Berkey 1 Oldham, NE NW SW 26-7n-3e, dry, TD 5,093 ft.

Seminole County: Jernigan & Morgan 1 Walker, NE SE SE 15-9n-8e, dry, TD 3,624 ft.

Kansas

Small Pumper Indicated At Ness County Discovery

SOHIO PETROLEUM CO. is setting pumping equipment at its 1 Pfannenstiel, indicated rank wildcat discovery well, located in the SW SW SW 6-19-23, 1½ miles south of Ness City, in Ness County, western Kansas, following a 2-hour swabbing test which recovered 5 bbl. of oil with 4 bbl. of water. Pay zone is in the Mississippian, with hole open below 4,282 to 4,303 ft. Nearest other production is in the Aldrich area, 13 miles to the northwest.

The same company is completing another discovery well, its 1 Cook, SW SW NE 8-19s-13w, 2½ miles north of Great Bend, in Barton County. The well produced at its rate of 13 bbl. of oil per hour for 12 hours in swabbing tests of its Lansing pay zone, opposite which casing is perforated at 3,347-54 ft. Arbuckle lime, topped at 3,443 ft. and drilled to 3,469 ft. had only a slight show. Location is 4 miles northeast of the Great Bend Airport pool, nearest production.

Jones, Shelburne & Farmer are completing two discovery wells, one in central Rooks County, and the other in southeastern Trego County. The former, 1 McMullen, NE NE SW 33-8-17, 3 miles south of Stockton and a mile south of the Stamper pool, swabbed 6 bbl. of oil per hour from Arbuckle lime at 3,455-59 ft. The other, 1 Groff, SW SW SW 26-14s-21w, 1½ miles southeast of the Sunnyslope pool, swabbed 3½ bbl. of oil per hour from the Conglomerate zone with casing perforated at 3,822-25 ft. and 3,828-32 ft. It also was dry in the Arbuckle, logged at 3,855-65 ft.

Testing operations are being continued at G-M-R Oil Co.'s prospective discovery well, 1 Hartley, located 9 miles northwest of Jetmore, in northwestern Hodgeman County, western Kansas. The well swabbed initially, after acidizing, at the rate of 11 bbl. of oil but recovery rate declined rapidly, and at the end of 17 hours the well was making less than a barrel per hour. Initial tests were with hole bottomed at 4,581 ft. in Mississippian, topped at 4,569 ft. Deepened to 4,585 ft., the well swabbed at the rate of 3½ bbl. per hour. Deepened further to 4,606 ft., it swabbed ½ bbl. of fluid, 50 per cent water, per hour. Hole is being plugged back for further tests. Spot location is in the NE NE NE 2-22-25.

Victor Drilling Co. 1 Windholz, SW SW NE 6-13s-16w, 2 miles west of the Emmeram pool, in Ellis County, swabbed 2 bbl. of oil per hour natural from casing perforations at 3,520-30 ft. in Arbuckle lime, topped at 3,523 ft. and drilled to 3,570 ft. Pay is being acidized for further tests.

KANSAS SUCCESSFUL WILDCATS

Graham County: Jones, Shelburn & Farmer 1 Mickleson, NW NW SE 27-8s-22w, pumped 278 bbl. of oil from Arbuckle 3,762-75 ft., TD 3,775 ft. (opens Mickleson pool).

Stafford County: Petroleum, Inc. 1 Walls, SE NE SE 29-22s-13w, pumped 505 bbl. of oil daily from 3,641-49 ft., TD 3,940 ft. (opens Mountview pool).

KANSAS WILDCAT FAILURES

Barton County: Hilton Drilling Co. 1 Mullins, SE SW NW 22-19s-13w, dry, TD 3,500 ft.

Lane County: Amerada Petroleum Corp. 1 Ohnmacht, CE SE NE 5-20s-29w, dry, TD 4,785 ft.

Reno County: Musgrove Petroleum 1 Davidson, NW NW NW 33-23s-9w, dry, TD 3,801 ft.

Saline County: Berry & Fick 1 Hoeffner, NW NW SW 23-14s-2w, dry, TD 3,526 ft.

Stafford County: Vickers 1 Garvin, SE SE NW 8-22s-13w, dry, TD 3,835 ft.

Central Area

ILLINOIS

Nation Oil Co.'s new lower Renault discovery well, 1 Westphilinger, SW SW SE 12-8s-9e, 6 miles southwest of New Haven, in Gallatin County, produced at the rate of 48 bbl. of oil per day in initial swabbing tests prior to acidizing. Pay is open through casing perforations at 2,778-84 ft. Hole had been drilled to 2,948 ft. in McClosky lime, in which only slight oil and gas showings were obtained. Bottom of casing is at 2,936 ft. on the latter zone. Location is approximately ¼ mile from production in the Inman West field.

A Biehl sand extension well is being completed by Francis L. Beard on the east side of the Allendale Consolidated field in the area 1½ miles southwest of Allendale, in Wabash County. The well, 1 H. A. Fox, SEc SE NW SW 26-1n-12w, swabbed at the rate of 5 bbl. of oil per hour while testing pay at 1,400-25 ft. in open hole at 1,375-1,447 ft. Location is ½ mile northwest of a recent Tar Springs extension well drilled by George & Wrather. That well, also 1 H. A. Fox, and spotted in the SW NW NW 26-1n-12w, swabbed at the rate of 2 bbl. of oil per hour with pay at 1,672-80 ft. Both wells are being put on the pump.

INDIANA

Sanders & Fye Drilling Co. is preparing to test promising oil showings encountered in its 1 Kohlmeyer, a wildcat located southwest of Mackey, in Gibson County. Spot is in the SW NE NW 21-3s-9w. Best showings were in Cypress sand at 1,564-70 ft., where a 90-minute drill-stem test recovered 30 ft. of clean oil, and through which casing has been run. Lower Renault at 1,762-64 ft., Rosiclare at 1,823-31 ft., and McClosky at 1,866-72 ft. also carried some oil saturation. Total depth is 1,990 ft. Location is 1½ miles southeast of the Mackey West pool.

A quarter-mile extension of the Owensville North pool, also in Gibson County, is in prospect where Hoyt Lovelace has run casing to test his 2 Armstrong, C W½ SE SW 20-2s-11w. The indicated well gassed in 6 minutes and recovered 1,200 ft. of oil without any water in a 60-minute drill-stem test of McClosky lime at 2,313-18 ft. The area is 5 miles southwest of Princeton.

L. F. Wilson 1 Huppe, SE SE SE 12-7s-13w, ½ mile from production in the Lamott area, 3½ miles east of Mount Vernon, Posey County, swabbed and flowed initially at the rate of 17 bbl. of oil per hour natural in productivity tests of Cypress sand at 2,360-71 ft. It made approximately 600 bbl. of oil over a period of 30 hours.

WESTERN KENTUCKY

The new area being opened for production, 4 miles northwest of Stanley, in the northwestern tip of Daviess County, and about 2 miles east of the Reed East pool, in eastern Henderson County, nearest other production, has indications of its second well. The new well, William E. Styles 1 Donovan, recovered 300 ft. of clean oil in a 60-minute drill-stem test in McClosky lime at 1,784-1,800 ft. Its location is approximately ½ mile west of the area's indicated discovery well, M. W. Howard 1 MacHensley, located in the SE SE NW 19-Q-27. Completion of the latter well has been delayed by a fishing job which developed while the well was being put on the pump. Previously, it had filled 400 ft. with oil in 1½ hours after perforating casing at 1,781-90 ft. in the McClosky pay.

EASTERN KENTUCKY

In Elliott County, 20-T-76, Herschenroeder's 1 M. S. Pennington on the Sandy Hook anticline has been abandoned as a dry hole after finding no oil or gas in the Corniferous lime to a total depth of 1,433 ft. Top of formation was found at 1,375 ft.

In Greenup County and located in 24-X-80, Arnold's 1 Elmer Howard has been put on production from the Corniferous lime but no results of tests have yet been announced. Corniferous lime was topped at 1,517 ft. and drilled to a total depth of 1,531 ft.

In northern Knott County and on the E. J. Evans Fee land, United Carbon Co. have completed 38 E. J. Evans for a 4 bbl. per day oil from the Maxon (Mississippian) sand at a total depth of 1,629 ft. Maxon sand was logged from 1,579-1,618 ft.

MICHIGAN

A new Dundee oil discovery well appeared likely for Michigan as Lud Segerlund logged a Dundee oil pay at his 1 Caner et al, NE NE NE 11-19n-5w. Greenwood Township wildcat, Clare County, Dundee top was logged at about 4,052 ft. and brown crystalline vugular dolomite oil pay was drilled from about 4,054 to 4,066 ft., present total depth. Two drill-stem tests were run and then hole was cased and cemented in with 5-in. casing at about 4,052 ft. Originally this wildcat had been projected as a Richfield oil test. First drill-stem test was run at 4,056-60 ft. In 45 minutes well showed an estimated 75,000 cu. ft. of gas, 190 ft. of oil-cut mud and 180 ft. of drilling mud. Second drill-stem test was run for 2 hours from 4,054-64 ft. Gas showed in 10 minutes, and was estimated at 100,000 cu. ft. Well showed 90 ft. of clean oil, and 270 ft. of mud-cut oil, more oil than mud. Both the oil and the dolomite pay section penetrated appeared to be typical of other Dundee dolomite pay oil pools in Michigan. This potential discovery is located about 5 miles southeast of East Winterfield Dundee pool, about 8 miles northeast of Freeman-Redding Dundee oil pool, 8 miles south of North Hamilton Richfield oil and Marshall gas pool, and about the same distance southeast of Cranberry Lake pool, which is producing oil from Traverse, Dundee and Richfield, and is also a Stray sand gas storage reservoir. All of these pools are located in Clara County.

Segerlund's wildcat is located just east of the center of a 3,800-4,000 acre drilling block, and Ervin Major, Standish producer, and others is associated with him in his venture. Area was previously core-drilled by The Pure Oil Co., but Pure does not have a lease in

the play. Wildcat showed a 27-ft. thinning in the Traverse-Dundee interval and logged Dundee top about 90, or more ft. higher than an earlier Dundee test located nearly 2 miles to the southeast. It is about structurally flat with another control point located about 2½ miles to northwest, only two close Dundee failures.

ILLINOIS SUCCESSFUL WILDCATS

Madison County: Schenk Drilling Co. 1 Leitch, NW NE NE 34-6n-6w, IP 15 bbl., Pennsylvanian sand 561-66 ft., TD 566 ft. (extension Livingston South pool).

Marion County: Ralph Talbot et al 1-T Davidson, CL W½ SE NE 34-4n-1e, IP 182 bbl., Devonian 2,952-56 ft., TD 4,178 ft. (opens new pay zone Patoka East pool).

White County: D. B. Lesh Drilling Co. 1 Jones, SE NW NE 12-4s-9e, IP 225 bbl., O'Hara 3,317-23 ft., TD 3,410 ft. (extension Centerville pool).

ILLINOIS WILDCAT FAILURES

Clinton County: T. G. Glass 1 Buechle, SE SE NE 12-3n-2w, dry, TD 1,501 ft.

Franklin County: G. H. Smith et al 1 Johnson, NW SW NW 33-5s-1e, dry, TD 2,836 ft.

Calvert Drilling, Inc., et al 1 Ziegler, NW SW SE 36-7s-1e, dry, TD 2,749 ft.

Gallatin County: Ralph Halbert 1 Myer, NW SW SW 23-7s-8e, dry, TD 2,914 ft.

Lawrence County: Big Four Oil & Gas Co. 1 Robinson, SW NE SE 36-3n-13w, dry, TD 2,307 ft.

Madison County: G. T. Loper 1 Dustman, W½ NW NE SW 28-6n-7w, dry, TD 543 ft.

Marion County: N. V. Duncan 1 Howe, SE NE NE 4-2n-4e, dry, TD 2,832 ft.

Montgomery County: E. L. Wirth 2 Poppenpohl, SW NW SW 10-10n-4w, dry, TD 2,090 ft.

E. White 1 Hughes, NW SE SW 14-7n-4w, dry, TD 645 ft.

Shelby County: Nation Oil Co. 1 Hedges, NW SE NW 2-13n-2e, dry, TD 2,684 ft.

T. G. Glass 1 Horsman, SW SW NE 17-11n-3e, dry, TD 3,056 ft.

Wabash County: Stanford Oil Co. 1 Schonert, NW NW SE 23-1n-14w, dry, TD 3,033 ft.

Columbus Exploration Co. 1 Hamilton, SE NW SE 4-1s-13w, dry, TD 1,751 ft.

Washington County: H. Rutherford 1 Hales, NE SW SE 27-1n-1w, dry, TD 1,530 ft.

White County: C. E. Brehm 1 Wilson, SW SE NE 19-6s-11e, dry, TD 3,041 ft.

INDIANA SUCCESSFUL WILDCAT

Gibson County: Ashland Oil & Refining Co. 1 Kissel, SE SE NE 34-2s-10w, IP 85 bbl., lower Renault 1,932-46 ft., TD 2,078 ft. (discovery well Barrett-Mitchell West pool).

INDIANA WILDCAT FAILURES

Gibson County: Graves & Wheeler 1 Turpin, NW NW NE 21-1s-10w, dry, TD 1,872 ft.

Winmar Oil Co. and C. E. O'Neal 1 Thompson, SE SE SE 31-2s-11w, dry, TD 2,447 ft.

Pike County: C. Stroble 1 McDavid, NW SE NW 21-1n-8w, dry, TD 1,360 ft.

Posey County: Calvert Drilling, Inc., 1 Brown-Fisher, SW NW SW 32-5s-12w, dry, TD 2,964 ft.

C. E. O'Neal 1 Roesner, SE SW SW 12-6s-12w, dry, TD 2,807 ft.

Calvert Drilling, Inc., 1 Wilderman, NE NE NE 22-6s-12w, dry, TD 2,771 ft.

Vanderburgh County: F. W. Meyer, Jr., 1 Opperman, NE SW NE 4-8s-11w, dry, TD 1,688 ft.

Vigo County: T & H Corp. 1 Nunn, NW NE SE 27-11n-8w, dry, TD 1,841 ft.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

McLean County: J. C. Miller and Ashland Oil & Refining Co. 1 Price, SE NW SE SW 17-N-26, IP 110 bbl., Jackson 1,110-21 ft., TD 1,550 ft. (discovery well Beach Grove South field).

WESTERN KENTUCKY WILDCAT FAILURES

Daviess County: J. C. Miller and Ashland Oil & Refining Co. 1 Livers, SE NW NW 23-O-26, dry, TD 2,404 ft.

Henderson County: T. M. Egan 1 Bower, W½ NW NE SW 6-Q-27, dry, TD 2,051 ft.

McLean County: R. E. Stouder 1 Gunterman, SW NE SW 4-L-27, dry, TD 2,673 ft.

Ohio County: Shaw Oil & Chemical Co. 1 Mosely, NE SE NW 4-K-33, dry, TD 1,272 ft.

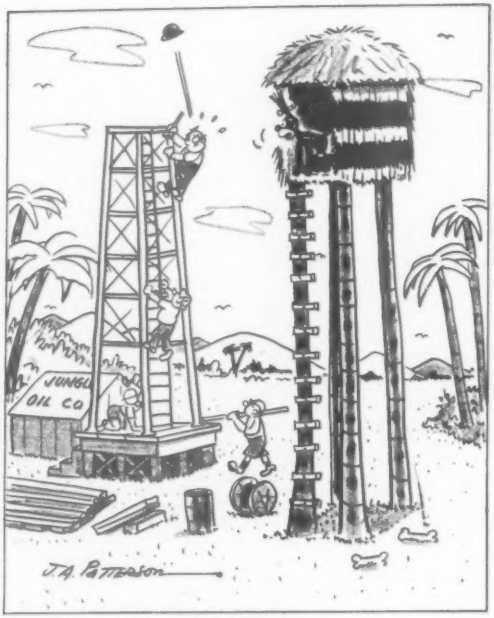
MICHIGAN WILDCAT FAILURES

Allegan County, Heath Township: Allied Investments, Inc. 1 Middlemas, NE NE SE 35-3n-14w, Traverse 1,478 ft., dry, TD 1,490 ft.

Isabella County, Broomfield Township: Northern Plains Petroleum Co. 1 Cross & Renwick, C SE 32-14n-6w, Michigan Stray sand 1,418 ft., dry, TD 1,442 ft.

Otsego County, Chester Township: Brazos Oil & Gas Co. 2 IE State-Chester, C NW NW 16-29n-2w, dry in Niagaran, TD 6,791 ft.

Ottawa County, Zeeland Township: P. K. Degenther 1 Wabeke, SE NE NW 15-5n-14w, Traverse 1,599 ft., dry, TD 1,655 ft.



THE OIL AND GAS JOURNAL

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Completions Figure Lowest Since April 1951

by John C. McCaslin

SEPTEMBER total completions were the lowest since April 1951, hitting a new low for the year. The month's completions fell 470 below August, 270 below September 1951. Total oil wells completed during the month showed a 16 per cent decline from August, while successful gas wells were down 12 per cent. Dry holes completed were down 9 per cent from the preceding month. Total footage drilled during the month was only 13,790,693 ft., the lowest since June 1951.

Cumulative 1952 completions stand at 34,763 wells, up 5 per cent over last year. Cumulative oil-well completions are up 5 per cent over last year, while gas wells and dry holes are both up, 10 and 6 per cent, respectively. Cumulative footage drilled so far this year by the industry totals 142,672,452 ft.

Operators need to drill but 11,028 wells during the next 3 months of this year to reach the 1952 total forecast by the Journal in the Midyear Number. In July the Journal forecast that 188 million feet of hole would be drilled this year. Operators need to drill 45,418,000 ft. during the remaining period of the year to reach that total, or an average 15,139,000 ft. of hole per month. An average of 3,676 wells per month from now until January 1 will fulfill the Journal's forecast of 45,791 wells drilled in 1952, far below the goal of 50,000 wells desired by both the industry and the Government.

The loss of about 5,000 wells will mean the loss of 113,000 bbl. daily of potential productive capacity, according to estimates of the Petroleum Administration for Defense, with overall drilling operations not expected to reach presteel-strike levels until early next year.

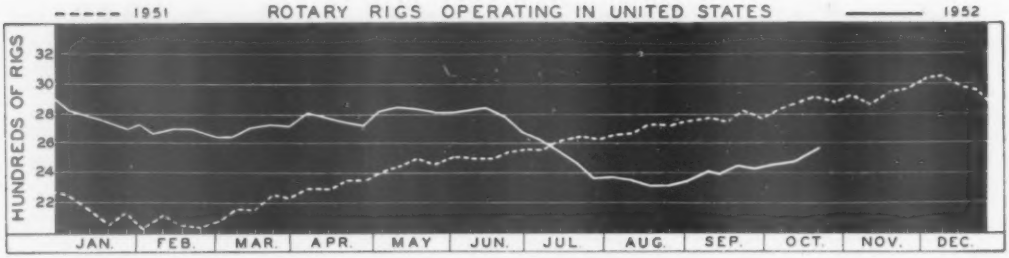
September by areas . . . Drilling company officials in Alberta, Canada, stated early in the month that due to the crippling effect of the recent steel strike in the United States, no full-scale resumption of drilling activities in the province is foreseen for about 2 months.

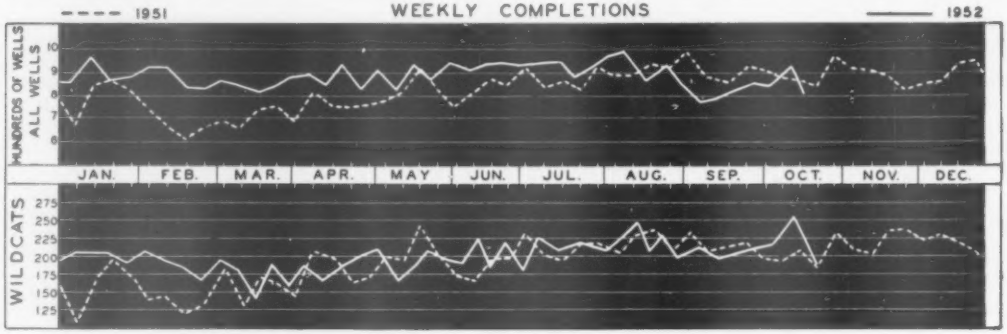
Cumulative completions in Oklahoma stand at 4,342 wells. Of the total 2,339 are oil wells, 206 gas, and 1,797 are dry holes. Cumulative footage in the state stands at more than 16 million feet. Kansas cumulative total wells stand at 3,489: 1,721 oil wells, 223 gas wells, and 1,545 dry holes with footage totaling 11,871,725 ft.

SUMMARY OF COMPLETIONS, SEPTEMBER 1952

	Total comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	65	33	0	32	65	0	0	0	0	0	94,000	75
Pennsylvania	161	83	11	67	155	6	0	0	0	0	271,028	175
West Virginia	58	3	42	13	30	27	1	0	0	0	160,003	158
Maryland	2	0	2	0	0	2	0	0	0	0	7,021	8
Ohio	68	27	12	29	32	36	0	0	0	0	141,856	166
Kentucky	129	36	19	74	92	37	0	0	0	0	246,359	163
Illinois	226	89	4	133	84	142	0	0	0	0	570,159	272
Indiana	131	46	1	84	103	28	0	0	0	0	229,753	157
Michigan	41	12	3	26	22	19	0	0	0	0	108,035	112
Kansas	315	151	28	136	38	269	8	0	0	0	1,073,331	139
Nebraska	35	10	0	25	1	18	16	0	0	0	175,475	32
Oklahoma	403	207	25	171	119	187	74	18	5	0	1,507,253	353
Texas	1,160	610	62	488	255	407	275	179	32	12	5,641,264	1,220
N. Central (Dist. 7-B & 9)	406	198	3	205	135	193	75	3	0	0	1,399,788	314
West (Dist. 7-C & 8)	295	213	3	79	28	85	93	67	13	9	1,772,848	334
Panhandle (Dist. 10)	37	13	11	13	7	27	2	0	1	0	127,670	62
Eastern (Dist. 5 & 6)	40	17	5	18	0	17	15	8	0	0	226,977	89
Gulf Coast (Dist. 2 & 3)	194	77	23	94	15	44	44	74	16	1	1,286,584	221
Southwest (Dist. 1 & 4)	188	92	17	79	70	41	46	27	2	2	827,397	200
Louisiana	168	89	16	63	38	29	33	29	27	12	1,080,075	279
North	93	48	9	36	36	22	27	7	1	0	362,908	111
South	75	41	7	27	2	7	6	22	26	12	717,167	168
Arkansas	37	17	0	20	6	25	6	0	0	0	140,515	54
Mississippi	24	6	1	17	0	11	8	3	2	0	161,708	34
Ala.-Ga.-Fla.	6	4	0	2	0	0	4	2	0	0	36,986	6
Montana	30	16	2	12	16	10	0	3	1	0	106,605	82
Wyoming	50	23	0	27	11	18	15	5	1	0	236,575	146
Colorado	32	11	3	18	0	16	16	0	0	0	164,645	67
Utah	7	2	1	4	0	1	3	3	0	0	51,001	23
New Mexico	76	27	31	18	24	10	16	15	11	0	429,817	183
California	210	139	6	65	51	82	44	23	8	2	953,871	251
North Dakota	22	19	0	3	0	1	0	20	0	1	185,952	30
Miscellaneous	§20	0	4	16	19	1	0	0	0	0	17,406	¶32
Total September 1952	3,476	†1,660	273	*1,543	1,161	1,382	519	300	87	27	13,790,693	‡4,217
Total August 1952	3,946	1,938	313	1,695	1,246	1,601	601	337	130	31	16,120,870	4,985
Total September 1951	3,746	1,940	231	1,575	1,338	1,480	594	230	79	25	14,221,120	6,051
Cumulative 1952	34,763	18,196	2,423	14,144	10,704	13,936	6,084	2,748	1,034	257	142,672,452	.....
Cumulative 1951	32,732	17,355	2,182	13,195	10,969	13,637	5,302	1,868	800	156	125,345,333	.....
Alberta, Canada:												
September 1952	130	†76	14	40	23	57	47	3	0	0	558,629	.....
August 1952	152	85	12	55	26	75	47	4	0	0	620,691	.....
Cumulative 1952	1,169	682	96	391	160	477	508	20	4	0	5,084,422	.....
Cumulative 1951	887	586	71	230	93	435	345	13	0	0	3,511,717	.....

*Incl. 117 service wells: N. Y. 32, Pa. 60, Ohio 7, Ill. 1, Ind. 1, Mich. 3, Kans. 1, Okla. 11, N. Cent. Tex. 1. †Incl. 26 condensate wells: W. Tex. 2, E. Tex. 5, Tex. Gulf Coast 11, S.W. Tex. 1, S. La. 7. Alberta 1 (not incl.). ‡Incl. all wells rigged up and/or drilling at month end. §Incl. Mo. 4, 2 gas, 2 dry, 3,580 ft.; Tenn. 15, 2 gas, 13 dry, 10,018 ft.; S. D. 1 dry, 3,808 ft. ¶Incl. Mo. 9, Tenn. 20, Idaho 3.





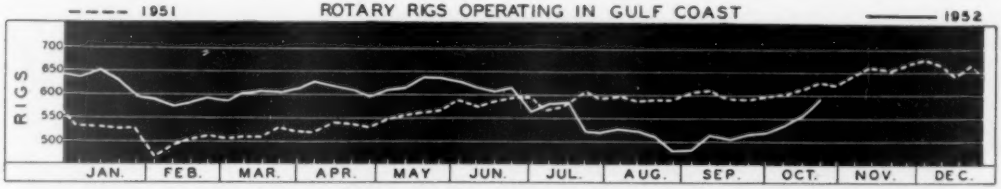
CURRENT STATISTICS

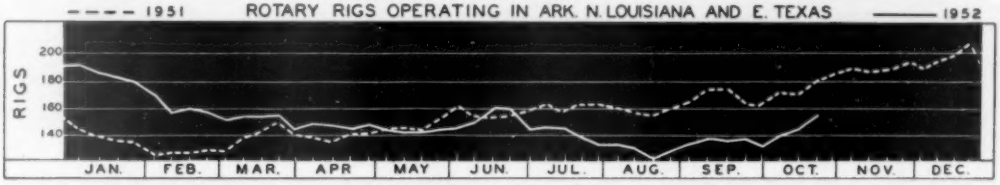
EXPLORATION

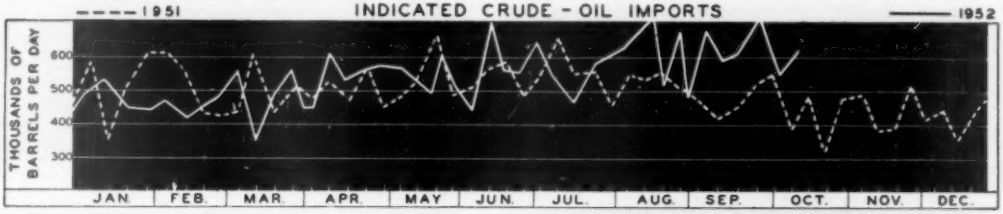
WEEKLY WELL COMPLETIONS . . . WEEK ENDED OCTOBER 18, 1952

	Total of all wells					Oct. 18		Wildcat completions and discoveries					Cumulative total, 1952				
	Comp.	Oil	Gas	Dry	Footage	1952	1951	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	16	8	0	*8	23,500	625	522	0	0	0	0	0	0	0	0	2	2
Pennsylvania	40	21	2	†17	67,757	1,593	1,389	0	0	0	0	0	0	0	0	2	2
West Virginia	14	2	10	2	54,509	498	501	0	0	0	0	0	0	0	4	7	11
Ohio	20	6	8	‡6	47,638	810	779	0	0	1	0	1	2	0	8	16	26
Indiana	21	5	0	16	38,669	1,009	1,114	1	0	0	8	9	29	0	2	290	321
Kentucky	21	4	5	12	44,899	1,039	1,041	1	0	0	4	5	20	0	1	213	234
Illinois	53	18	0	35	131,128	1,622	1,998	3	0	0	15	18	22	0	1	450	473
Michigan	12	5	0	7	36,865	568	616	0	0	0	4	4	22	0	4	194	220
Kansas	74	37	3	§34	243,774	3,705	3,492	2	0	0	5	7	84	0	13	609	706
Nebraska	4	2	0	2	17,147	252	192	1	0	0	2	3	11	0	2	139	152
Oklahoma	123	54	14	¶55	487,090	4,650	4,430	1	1	0	13	15	83	3	11	493	590
Texas	258	137	16	105	1,131,021	13,855	13,343	13	0	2	71	86	649	44	100	3,096	3,889
North Central (Dist. 7-B & 9)	99	48	0	51	299,257	4,371	4,034	10	0	0	34	44	360	2	24	1,271	1,657
West (Dist. 7-C & 8)	59	39	2	18	321,381	4,215	4,044	2	0	0	13	15	141	1	6	581	729
Panhandle (Dist. 10)	8	4	2	2	31,826	536	574	0	0	0	2	2	4	0	7	47	58
Eastern (Dist. 5 & 6)	13	6	4	3	88,083	733	988	1	0	2	3	6	17	4	4	185	210
Gulf Coast (Dist. 2 & 3)	44	19	5	20	259,561	2,090	1,854	0	0	0	10	10	63	26	27	457	573
Southwest (Dist. 1 & 4)	35	21	3	11	130,913	1,910	1,849	0	0	0	9	9	64	11	32	555	662
Louisiana	34	21	1	12	196,350	1,833	1,744	0	0	0	8	8	37	17	11	249	314
Northern	24	15	0	9	99,624	1,005	956	0	0	0	6	6	15	0	7	125	147
Southern	10	6	1	3	96,726	828	788	0	0	0	2	2	22	17	4	124	167
Arkansas	8	0	0	8	39,721	323	337	0	0	0	1	1	6	0	0	71	77
Mississippi	5	2	0	3	29,156	273	286	1	0	0	2	3	15	2	1	125	143
Southeastern States	0	0	0	0	0	52	45	0	0	0	0	0	3	0	1	28	32
Montana	10	5	0	5	41,709	263	181	0	0	0	3	3	6	0	1	67	74
Wyoming	10	7	1	2	46,643	541	599	1	0	1	2	4	21	0	4	100	125
Colorado-Utah	14	4	1	9	66,484	424	243	0	0	0	6	6	17	0	8	176	201
New Mexico	21	12	6	3	135,629	837	548	0	0	0	2	2	33	2	1	82	118
California	37	25	0	12	162,257	1,953	1,864	1	0	0	9	10	62	0	6	397	465
North Dakota	6	3	0	3	46,155	83	4	0	0	0	2	2	4	0	0	22	26
Miscellaneous	0	0	0	0	0	58	83	0	0	0	0	0	0	0	21	24	45
Total United States	801	378	67	356	3,088,101	36,866	35,351	25	1	4	157	187	1,126	68	200	6,852	8,246
Total previous week	923	422	69	432	3,641,562			40	0	4	211	255	1,101	67	196	6,695	8,059
Total October 20, 1951	854	444	71	339	3,336,584			26	2	8	144	180	1,201	66	204	6,383	7,854

Service wells included: *8, †15, ‡2, §1, ¶8.



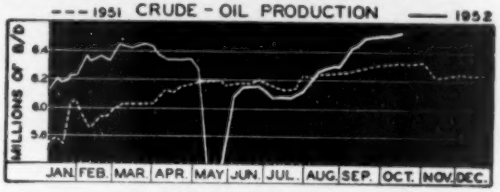


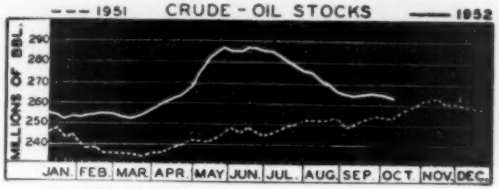


DAILY AVERAGE PRODUCTION FOR WEEK

	October 18, 1952			Oct. 11
	Crude oil	Lease condensate	Total	total
Alabama	3,000		3,000	3,100
Arkansas	74,700	700	75,400	75,050
California	982,600		982,600	982,100
Colorado	88,800		88,800	87,500
Eastern	58,600		58,600	58,500
Florida	1,600		1,600	1,600
Illinois	165,500		165,500	166,200
Indiana	33,000		33,000	34,300
Kansas	346,000		346,000	331,700
Kentucky	31,100		31,100	31,000
Louisiana	643,725	27,650	671,375	670,825
North	110,000	2,150	112,150	111,600
South	533,725	25,500	559,225	559,225
Michigan	33,700		33,700	34,100
Mississippi	91,550	3,675	95,225	95,100
Montana	26,800		26,800	26,500
Nebraska	8,300		8,300	8,200
New Mexico	171,950	400	172,350	172,150
Oklahoma	525,400		525,400	528,700
Texas	2,960,000	42,450	3,002,450	3,002,450
Dist. 1	37,100	200	37,300	37,300
Dist. 2	169,700	4,000	173,700	173,700
Dist. 3	485,100	23,400	508,500	508,500
Dist. 4	272,275	5,000	277,275	277,275
Dist. 5	51,525	250	51,775	51,775
Dist. 6	127,850	3,600	131,450	131,450
E. Texas field	249,000		249,000	249,000
Dist. 7-B	110,850	75	110,925	110,925
Dist. 7-C	172,750	5,400	178,150	178,150
Dist. 8	1,015,025	225	1,015,250	1,015,250
Dist. 9	186,500	275	186,775	186,775
Dist. 10	82,325	25	82,350	82,350
Utah	5,100		5,100	5,000
Wyoming	194,500		194,500	195,000
North Dakota	5,000		5,000	3,700
Total U. S.	6,450,925	74,875	6,525,800	6,512,775
Change from previous week			up 13,025	
Canada	220,700		220,700	182,625
Total U. S. production January 1-October 18			1,800,906,650 bbl.	
Same period last year (crude plus cond.)			*1,788,898,050 bbl.	

*Incl. 23,715,050 bbl. condensate.



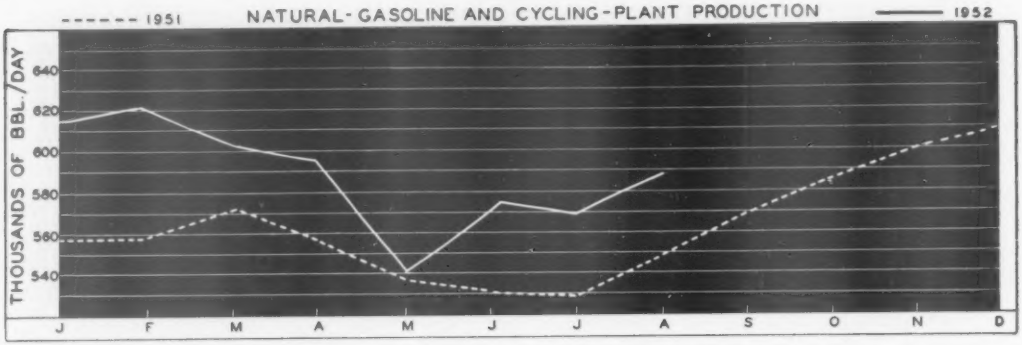


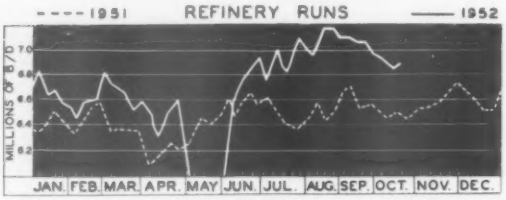
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

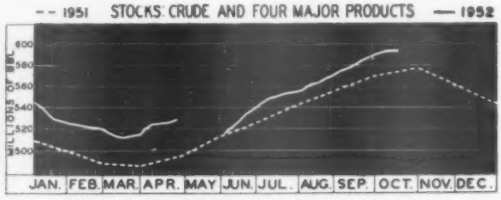
(Thousands of barrels)

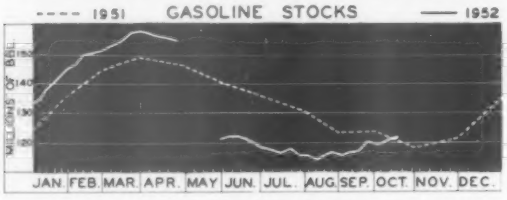
	Oct. 11, '52	Oct. 4, '52	Oct. 13, '51
Pennsylvania Grade	2,308	2,201	1,960
Other Appalachian	2,172	2,022	1,597
Illinois, Indiana, Michigan	12,086	12,166	12,841
Arkansas	2,866	3,009	2,758
Louisiana	16,024	15,660	15,027
North	2,488	2,390	3,508
Gulf	13,536	13,270	11,519
Mississippi	3,333	3,428	3,340
New Mexico	7,540	7,360	7,157
Oklahoma and Kansas	38,697	38,194	39,639
Texas	125,687	128,324	120,651
East Texas proper	12,367	12,310	(†)
West Texas	56,749	58,102	(†)
Texas Gulf	25,776	27,440	(†)
Other Texas	30,795	30,472	(†)
Rocky Mountain	14,471	14,503	13,536
California	30,916	30,529	29,227
Foreign	6,954	6,757	6,701
Total	263,054	264,153	254,434

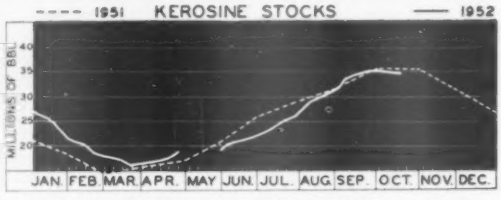
*Bureau of Mines. †Not comparable with current week.

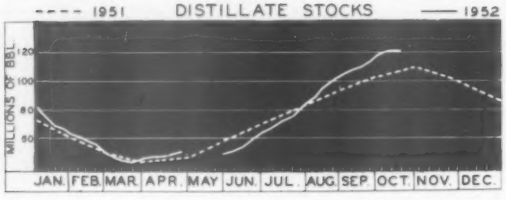


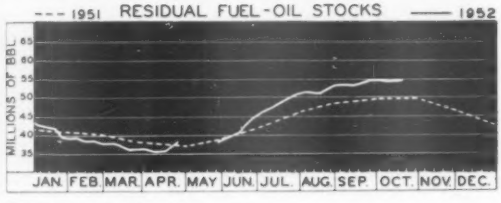










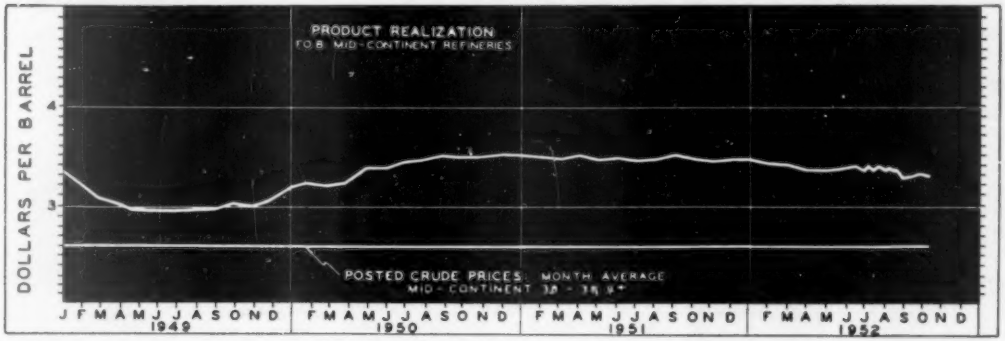


A.P.I. REFINERY REPORT, OCTOBER 18

(Thousands of barrels)

District—	Daily avg. runs	Daily average production Gaso.*	Kero.	Dist.	Resid.	Stocks‡ Gaso.†	Kero.	Dist.	Resid.	Bureau of Mines, October 1951 — Daily avg. runs	Daily average production Gaso.*	Kero.	Dist.	Resid.
East Coast	1,058	445.4	30.3	255.1	230.7	31,207	15,302	44,420	12,757	975	391.9	39.5	252.8	211.2
Appalachian:														
District 1	102	43.0	6.0	17.6	11.0	3,811	607	1,621	787	103	42.8	5.3	16.4	10.4
District 2	91	45.4	9.6	11.3	11.9	1,696	335	629	396	75	36.8	4.7	9.6	16.6
Ind., Ill., Ky.	1,226	661.7	74.0	211.3	149.8	25,002	7,584	23,036	6,747	1,152	624.3	70.8	190.6	172.2
Okla., Kans., Mo.	599	334.3	23.3	126.1	60.8	11,675	2,246	13,796	1,627	539	286.2	16.9	132.4	61.9
Inland Texas	281	195.4	12.8	52.4	36.7	4,220	418	2,537	1,178	260	183.7	12.9	39.7	41.0
Texas Gulf Coast	1,796	770.5	140.7	436.9	274.6	17,686	3,994	13,706	8,426	1,569	740.6	126.3	336.7	249.1
La. Gulf Coast	495	269.0	58.3	127.4	53.9	6,501	2,870	5,487	1,907	519	243.9	65.4	119.3	57.7
N. La. and Ark.	80	33.0	6.1	16.7	6.4	2,764	495	1,122	283	81	32.4	7.1	16.9	6.3
Rocky Mountain:														
New Mexico	19	10.7		2.9	3.9	103		68	151	17	9.9	0.5	2.5	3.9
Other Rocky Mtn.	210	96.7	8.6	37.0	38.6	3,110	432	2,256	1,070	186	90.9	6.7	35.3	39.7
California	941	402.3	1.3	160.0	324.1	14,227	285	12,465	19,121	970	421.8	7.4	143.3	354.0
October 18, 1952	6,898	3,307.4	371.0	1,454.7	1,202.4	122,002	34,568	121,143	54,450	6,446	3,105.2	363.3	1,295.5	1,224.0
October 11, 1952	6,854	3,290.3	377.1	1,442.0	1,169.7	120,910	35,529	120,076	54,423					
October 20, 1951	6,481	3,119.9	345.0	1,351.6	1,214.6	121,450	35,767	108,593	50,537					

*At refineries including natural blended. †Finished and unfinished. ‡At refineries, bulk terminals, in transit, and in pipe lines.


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
DOLLARS PER BARREL
4
3
POSTED CRUDE PRICES, MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
J F M A M J J A S O N D
1949
F M A M J J A S O N D
1950
F M A M J J A S O N D
1951
F M A M J J A S O N D
1952

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate and fuel oil. Realization averaged $3.30 for week ended October 11, $3.32 for previous week, and $3.49 for October 1951. The above trend information is based on volumes and current prices and therefore does not reflect changes in operating costs.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of October 22, 1952. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅜-10½	12.125-12.75	10¾-11
Premium gasoline, 86-88 octane	11⅜-11½	13.25-14.0	11¾-12
42-44 w.w. kerosine	8⅝-9	10.4-10.65	9
No. 2 straw fuel oil	7⅝-8	9.4-9.65	8
No. 6 residual	$0.85-1.00	$2.00-2.25	$1.50-1.75

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	6⅞	6⅜	6⅝
Grade 18-55	8.25	7.75	8.0

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	13-13.5
750 vis., No. 3-4 neutral	16
2,000 No. 5-6 neutral	18-19

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	26-27
200 vis., No. 3 neutral, 0-10 pp.	14-15

Western Pennsylvania

145-155 vis., 10 p.t. bright stock	32.5
180 vis., 0 p.t. neutral	31.5

WAX

Mid-Continent

132-134 A.M.P.	5.5

REPORTS of sales and product shifts in the gasoline market indicate that at least a few refiners are making careful studies of production and stock trends of this product. Some feel that the high level of refinery runs in the third quarter turned the gasoline-stock curve upward earlier than was justified on a basis of a normal seasonal change in demand.

Gasoline inventories reached a low point last year on November 10, but this year the low came on August 16. While the general low level of gasoline stocks during the summer months was due to the loss of production during the refinery strike, a continuation of the upward trend that has existed since the middle of August could produce burdensome inventories before the winter is over.

Gasoline stocks were at about last year's level on October 11, but there is a possibility that stocks will be at least 6,000,000 bbl. above last year by November 8.

Demand for heavy fuel is showing some signs of improvement, but most of the indicators were related to expected increases later this year rather than to actual gains in current shipments. The relatively large volume of chartering activity in recent weeks has cut down on the number of available dirty tankers for heavy fuel. The possibility of an extended strike by coal miners has brought inquiries from industrial accounts trying to establish sources of supply of No. 6 to be used if there is a shortage of coal or if coal prices are raised materially.

Spot demand for light fuels is still very slight on most of the important markets, but most suppliers are expecting some relief from extra-heavy inventories if the cooler weather continues into the last week of October.

There is less pressure on the kerosine market from stocks than for either distillate or residual. A larger part of the kerosine cut has been going for jet fuel.

CRUDE PRICES

GRAVITY SCHEDULE

	Signal Hill, Calif.‡	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.93	....	....	....
19-19.9	1.98	....	....	....
20-20.9	2.03	$2.25	....	$2.12
21-21.9	2.07	2.27	....	2.14
22-22.9	2.12	2.29	....	2.16
23-23.9	2.18	2.31	....	2.18
24-24.9	2.24	2.33	$2.56	2.20
25-25.9	2.30	2.35	2.58	2.22
26-26.9	2.36	2.37	2.60	2.24
27-27.9	2.41	2.39	2.62	2.26
28-28.9	2.46	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.57	2.45	2.68	2.32
31-31.9	2.62	2.47	2.70	2.34
32-32.9	2.68	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico.

Last general price change represented a 50-cent increase, effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel	
Kettleman Hills, California*	$2.80
Louisiana:	
Beauregard Parish	2.60
Cotton Valley (distillate)	2.85
Cotton Valley (crude)	2.70
Texas:	
East Texas	2.65
Pecos County (Yates)	2.35
Conroe	2.83
Van	2.48
Pennsylvania Grade:	
Bradford	4.25
Southwest Pennsylvania	3.82
West Virginia	3.76
Illinois Basin	2.77

*37°-37.9°.

EQUIPMENT MEN . . . in the News

Magcobar Names Four Sales Promotions

Four members of the Magcobar sales organization have recently been promoted, Williard M. Johnson, Magnet Cove Barium Corp. president, has announced.

Joe Webster has been appointed assistant general sales manager; Ray Dillman succeeds Webster as manager of the Texas Gulf Coast division; Ernest Howell has been appointed supervisor of District 3, and Jack Walker has been named export salesman.

J. WEBSTER

R. DILLMAN

Webster joined Magcobar in February 1947 as service engineer in South Louisiana. He served as district supervisor at Victoria, Tex., from March 1949 to June 1951, and has been division manager of Texas Gulf Coast division since June 1951. Prior to joining Magcobar, Webster was a driller for Hinkle Drilling Co.

Dillman joined Magcobar in March 1948, and was district supervisor from July 1949 to December 1950. Since that time he has been division service manager of the Mid-Continent division at Tulsa.

A graduate of Rice Institute, Howell joined Magcobar in January 1950.

Since joining Magcobar in February 1949, Walker has been district supervisor at Victoria, and has served in New Orleans, Farmington, N. M., and in Canada.

Representative of French Manufacturer Visits U. S.

Paul Guinard, son of the president of Ets. Pompes Guinard, pump manufacturer in Paris, France, is visiting pump-manufacturing and petroleum-industry firms in the Tulsa area.

Pompes Guinard, in addition to other products, manufactures B-J pumps under a licensing agreement with Byron Jackson Co. After Guinard has completed his work in Tulsa, he will go to Byron Jackson's Los Angeles plant to familiarize himself with production methods.

While in California Guinard will attend special courses in engineering at California Institute of Technology in Pasadena. He is a graduate of Leon XIII at Chaleauroux, Saint Sazare at Autun, and Ecole Polytechnique de L'Universite de Lausanne, in Switzerland. Before rturning to France, he expects to visit the International Petroleum Exposition in Tulsa next May.

Totco Appoints Davis To Southern Oklahoma

H. H. (Pete) Peters, vice president, Technical Oil Tool Corp., has announced the appointment of John Davis as representative for Totco in southern Oklahoma. Davis will service the area covered by the Continental Supply Co. stores at Duncan and Healdton, Okla.

JOHN DAVIS

Davis replaces R. K. (Dick) Palmer, who for the past 5 years has served the southern Oklahoma territory for Totco. Palmer has resigned to enter business in Tulsa.

Steinwender Named Sales Vice President of Scaife Co.

Sheller L. Steinwender has been appointed to the new position of vice president, sales of Scaife Co.

Steinwender is known in the petroleum, gas, chemical, and steel industries through his service since 1944 with A. O. Smith Corp., where he was general sales manager of the eastern district. His responsibilities with Scaife Co. will include supervision of all sales activity of pressure vessels for gases, air, and liquids—range boilers, liquefied-petroleum-gas cylinders, and diesel starter tanks.

Prior to his affiliation with Scaife Co., Steinwender was associated with American Cyanamid Co.

Suder Is Made General Manager for Jarecki

Jarecki International Supply Division, H. K. Porter Co., Inc., Dallas, has announced the appointment of F. E. Suder as general manager of the division.

Suder, who was sales manager before his new appointment, will be in complete charge of all operations of Jarecki International. His experience covers more than 35 years in various phases of the oil and gas industry. He held sales and management positions with National Supply Co. and International Derrick & Equipment Co. before becoming associated with Jarecki in 1951.

Schlumberger Adds to California Field Staff

Schlumberger Well Surveying Corp. has announced two new appointments to its staff in the California area.

Charles B. Evans has been named manager of a new field office in Newhall, Calif. Stanley E. Coombs replaces Evans as manager of the Sacramento field office.

C. B. EVANS

S. E. COOMBS

Evans joined Schlumberger in 1948 after receiving a degree in electrical engineering at University of Southern California. He has served as field engineer in district offices at Long Beach and Bakersfield, Calif., and in January of this year opened a new office in Sacramento.

Coombs received his degree in electrical engineering at University of Texas, and joined Schlumberger in 1947. Prior to his transfer to Sacramento, he worked out of the Ventura district office.

Vinson Supply Opens New Store in Amarillo

New Vinson Supply Co. store at Amarillo, Tex.

J. G. CHILCOAT

A new Vinson Supply Co. store has been opened in Amarillo, Tex., as announced by Bailie W. Vinson, president.

Warehouse stocks carried in the new store consist of Crane and Nordstrom valves, Fisher controls, National pipe and steel tubes, Ladish welding fittings and flanges, and Chase tubes.

Jess G. Chilcoat has been appointed manager of Vinson's Amarillo Panhandle division. Prior to this appointment, Chilcoat served in the Vinson organization in Odessa, Tex., and the home office in Tulsa. He is a graduate of University of Texas in mechanical engineering.

W. J. (Bill) Enlow has recently been transferred from Vinson's Tulsa offices to Amarillo, where he will serve as sales engineer.

Tom Hughes, formerly with the company in Odessa, has been transferred to the new Amarillo store as office manager.

Cummins Sales Announces 21 Personnel Promotions

Twenty-one promotions have been announced from the Fort Worth offices of Cummins Sales & Service, Inc., by Ken W. Davis, president.

L. J. TROUTZ

H. H. HOPE

Promotions were made through the entire area of Cummins Sales & Service operations. L. J. Troutz is new Cummins Sales & Service general service manager. H. H. Hope has assumed new duties as division manager of diesel sales and service for Kansas and Oklahoma. Promoted to district manager of diesel sales and service were: R. J. Arroyo, E. W. Craft, Herbert Davis, W. N. Eason, G. E. Grimm, D. M. Peacock, C. E. Troutz, and A. C. Zugar. New service managers are: O. W. Boteler, W. R. Bowman, Lloyd Currell, and E. H. Smith. Promoted as managers of diesel stores are: E. C. Cain, Oklahoma City; J. T. Schedler, New Orleans; and R. E. Selleck, Wichita. New shop foremen are: J. P. Hunter, W. P. Over, and G. C. Winfree. New sales engineer in Oklahoma City is J. G. Griffith.

Troutz, former service manager at Odessa, Tex., has been transferred to the Fort Worth offices of the company with his promotion to general service manager. Hope was transferred from Wichita to Oklahoma City with his promotion to division manager of diesel sales and service.

Arroyo was former sales engineer at New Orleans before his promotion at the same location. Craft was transferred to Wichita Falls from Houston along with his promotion. Davis moved to Odessa from Wichita Falls with assumption of his new duties there. Eason at Oklahoma City, Grimm at Wichita, Peacock at Fort Worth, C. E. Troutz at Abilene, and Zugar at Houston were promoted at their present working locations.

Service manager Boteler was former shop foreman at the same location. Bowman was shop foreman at Fort Worth before his promotion to service manager there. Currell, shop foreman at Wichita Falls, was promoted to service manager at the same location. Smith, new service manager at Odessa, was formerly shop foreman at Odessa.

Hunter, Over, and Winfree have been promoted to shop foremen at Fort Worth, Oklahoma City, and Houston. All were serving as field service mechanics at their present locations.

Western Geophysical Moves Research Department

In pace with the continuing development of seismic prospecting equipment and technique, Western Geophysical Co. has moved its Los Angeles research department into a newly constructed and modern building at 923 North La Brea Avenue, Los Angeles. The new structure features an electronics research laboratory, shop facilities for the assembly and testing of all instruments and equipment required for geophysical prospecting, as well as for the exploitation of new ideas.

Ervasti Made Industrial Sales Manager at Wolverine

E. W. ERVASTI

E. W. Ervasti, sales representative for Wolverine Tube Division in the St. Louis area for several years, became manager of industrial sales in early October. This announcement was made recently by John M. Dumser, director of sales. Ervasti will make his headquarters at the general sales office in Detroit.

Lisle Returns to E.S.I. As Sales Manager

George M. Lisle has returned to Exploration Surveys, Inc., in the capacity of sales manager for country-wide gravimetric and magnetic surveys and reports, following his recent discharge from the Navy.

Prior to joining Exploration Surveys in 1950, Lisle was associated with Continental Corp.

Mid-State Chemical Names Parke to Tulsa Sales Div.

C. PARKE

W. B. Porter, president Mid-State Chemical Co., Inc., Mt. Vernon, Ill., has announced appointment of Carleton Parke as new sales representative for the company in Tulsa.

Parke graduated from Bucknell University in 1949 with a B.S. degree in mechanical engineering. The same year he entered the field of sales engineering in regard to chemicals used in the oil industry, where

he was actively associated before joining Mid-State Chemical. Parke will work out of Tulsa as far north as Wichita, and as far south as Oklahoma City.

Penn Appoints Eggelhof In Texas-Oklahoma Area

Penn Industrial Instrument Corp., of Philadelphia, has announced the appointment of Eggelhof Engineers, Inc., as its representatives in the Texas-Oklahoma area. Penn Industrial are manufacturers of a complete line of flow meters, as well as pressure, temperature, and level instruments, pneumatic transmitters, and air operated controllers.

Offices for Eggelhof Engineers are located in Houston, Dallas, Corpus Christi, San Antonio, Shreveport, and Tulsa.

Lane-Wells Develops Student-Aid Program

Commemorating 20 years of service to the oil industry, Lane-Wells Co. has launched a comprehensive student-encouragement program, consisting of fellowships, scholarships, and technical-paper contests. The program is open to undergraduate and graduate students of petroleum engineering currently attending a selected group of colleges in the United States and Canada.

According to James D. Hughes, general sales manager, the Lane-Wells Twentieth Anniversary Scholastic Program is being undertaken in order to encourage promising students to advance themselves and participate in further research in the field of petroleum engineering.

Student selections are being made on a basis of worthiness, scholarship, financial need, and interest in the field of petroleum engineering.

Substantial monetary assistance awards are being made in connection with fellowships and scholarships. Prizes in the technical-paper contest, consisting of $200 first prize and $100 second prize, are being awarded to the two students in each school who write the best and most original papers on a petroleum engineering subject of their own choice.

The 11 colleges with departments of petroleum engineering participating in the program are: University of California, University of Oklahoma, University of Texas, University of Tulsa, University of Southern California, Texas A. & M., Louisiana State, Colorado School of Mines, Pennsylvania State, California Institute of Technology, and University of Alberta.

Norris Marks Milestone in Seventieth Anniversary Year

W. C. Norris, Manufacturer, Inc.'s, new branch office and warehouse at Houston.

C. L. SNELLING

More adequately to serve the Gulf Coast area and the export market, W. C. Norris, Manufacturer, Inc., has expanded its facilities with a new branch office and warehouse at Houston, according to Ed C. Bolger, president. The new building is 70 by 200 ft. and provides 14,000 sq. ft. of warehouse space. Complete stocks of Norris products will be carried at the Houston branch.

Norris, now celebrating its seventieth year of service to the oil industry, has specialized in quality products designed to serve the production, refining, and pipe-line departments of the industry.

C. L. (Les) Snelling, former city salesman for Norris, is manager of the new branch. He began with Norris 10 years ago in the purchasing department, and is widely known in the oil industry.

Control Cells Is New Division of Loadcraft

Spencer - Safford Loadcraft, Inc., truck-trailer manufacturer in Augusta, Kans., has announced the opening of a new division to be known as Control Cells. This new division will produce and distribute an entirely new product which has been developed through a 2-year research program by the Research Foundation, University of Wichita, in conjunction with Loadcraft.

Control Cells is the trade name of a series of electronic measuring devices used in determining weights, pressures, and temperatures. The compact size, unusual accuracy, and low cost permit this device to be extensively used in many industrial applications where weights, forces, or energy need to be measured or automatically controlled.

Goodall Rubber Opens Warehouse in Odessa

A. O. WELLS

Goodall Rubber Co. of Texas has opened a warehouse in Odessa, Tex., to serve supply stores in the West Texas area, according to an announcement by H. (Barney) Barnard, Goodall president.

A. O. (Pappy) Wells, widely known West Texas oil-equipment salesman, has been named West Texas representative and will make his headquarters at the basin warehouse. Wells, formerly with Patterson-Ballagh, will contact both supply stores and drilling contractors.

John Garratt, who formerly represented Goodall in the West Texas area, will continue to be in charge of the territory, but will make his headquarters in Houston.

Tube Turns Acquires Kerotest Mfg. Co.

Tube Turns, Inc., Louisville, manufacturer of welding fittings and flanges, has announced the recent purchase of Kerotest Manufacturing Co., Pittsburgh, manufacturer of steel and brass valves. The corporate identity of Kerotest, now a wholly owned subsidiary of Tube Turns, will be retained.

Hainsworth Named Technical Advisor for Fluor Corp.

HAINSWORTH

J. S. Fluor, president of Fluor Corp., Los Angeles, has announced the appointment of William R. Hainsworth to the position of technical advisor to the executive vice president, J. Robert Fluor. Hainsworth was formerly research director and vice president in charge of engineering for Servel, Inc., and is well known in the gas industry.

Hainsworth holds a bachelor of science degree in chemical engineering from University of Washington, a master of science degree from California Institute of Technology, and a doctor of philosophy degree from Massachusetts Institute of Technology.

Kobe Names New Manager of Industrial, Export Sales

C. P. BROWN

Carl P. Brown has been named manager of industrial and export sales, according to a recent announcement by L. T. Wold, general manager of Kobe, Inc., division of Dresser Equipment Co. The company manufactures Kobe high-pressure triplex pump and Brown will be in charge of sales and service for eastern United States and export markets. He has been transferred to the new post in Cleveland from Houston, where he was area service manager for the company's hydraulic sales department.

Brown graduated in mechanical engineering from Cornell University in 1940. He began his diversified engineering experience as a special trainee of the Erie Railroad. Brown left the Army in 1946, and joined Kobe, Inc., as a sales engineer in 1947.

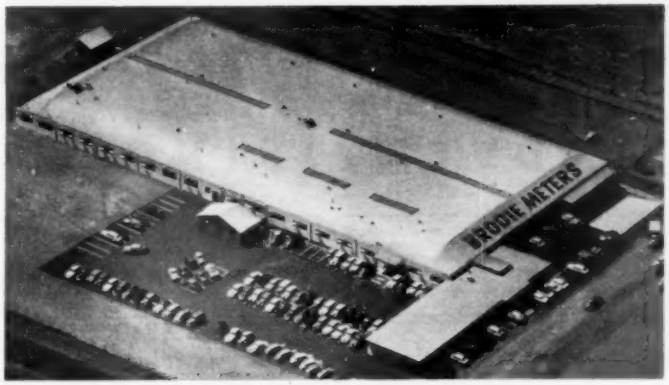
National Builds Larger Supply Store at Harvey, La.

National Supply Co. has built a larger oil-field supply store at Harvey, La., a key distribution point for southern Louisiana operators.

The new corrugated-steel structure is 50 by 100 ft. compared to the former 30 by 60-ft. structure. In addition to its sales room and offices, the building includes a large warehouse, dormitory, and storage yard for pipe and various equipment and machinery.

The store will be amply stocked with repair parts for heavy equipment now running in the area.

K. H. McFann is manager, and L. A. J. Monroe district manager.



Brodie Co. Completes New California Plant

Ralph N. Brodie Co., Inc., manufacturer of Brodie meters, recently completed an extensive new plant on a 6½-acre tract in the San Leandro, Calif., industrial area near Oakland International Airport. This latest expansion provides substantially enlarged engineering, research, production and office facilities, and represents the third major expansion over the period of 25 years in which the firm has specialized in petroleum-metering equipment. Brodie also maintains a plant at Mount Vernon, N. Y.

Larkin Completes New Warehouse at Shreveport

A new and greatly expanded warehouse was recently completed by Larkin Packer Co., Inc., at 1307 N. Market, Shreveport, in order to better serve that area, according to an announcement made by T. E. Alexander, sales manager.

The Larkin warehouse is a 40 by 80-ft. quonset-type building, which includes warehouse, office space, and living quarters for the Larkin warehouse representative.

A complete stock of Larkin equipment will be carried at this new location.

Wilson Supply Makes Harris District Manager

The Wilson Supply Co. has recently transferred Wayne H. Morris, former store manager at Beaumont, to Victoria, Tex., where he is now district manager of the Southwest area.

J. T. Watson was made manager of the Beaumont store, being transferred from New Iberia, La. Gordon Arceneaux, formerly manager of the store at Lake Charles, was moved to New Iberia. Jack Collins was transferred from Houston to Lake Charles as store manager there.

General Controls Co. Opens New Plant

General Controls Co.'s new plant of modern brick and steel structure at Skokie, Ill., is valued at $750,000 and consists of 60,000 sq. ft. of factory, warehouse, and office space. The building is located on a 5-acre site in the rapidly developing Skokie Valley industrial area. Official opening ceremonies were held in late September at a buffet luncheon and plant tour which attracted more than 200 civic and business leaders in the greater Chicago metropolitan trading area.

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UNDISPLAYED CLASSIFIED 20c a word one issue. 10% Discount three or more consecutive issues. $4.00 minimum charge. Blind Box in our care nine words. Payable in Advance.

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$14.00 a column inch one issue . . .
10% Discount three or more issues.

Address Classified Advertising Material: The Oil and Gas Journal, P. O. Box 1260, Tulsa 1, Okla.

EQUIPMENT FOR SALE

PIPE
All sizes; line pipe and casing, tanks, and Oilfield supplies. Edco Pipe & Supply Co., Phone 45970, P.O. Box 151, Tulsa, Oklahoma.

FOR SALE: National Drilling Machine #2 complete with tools. RIISE drilling motor A-1 condition. H. H. Henning, 627 7th Street, Marietta, Ohio.

SALES and rentals of cable drilling and fishing tools, casing and equipment. From the Southwest's largest stock of used cable tools and oil field supplies. Degen Pipe and Supply Co. Tulsa, Oklahoma

FOR SALE—One GMR-4 Cooper-Bessemer 300 horsepower, 300 rpm angle type engine equipped with three 8¼" x 14" compressors —maximum discharge 500#. Engine equipped with exhaust mufflers and air filters. Price $10.000 f.o.b. location near Parkersburg, West Virginia. Also, one Clark Bros. Super two cycle 125 horsepower 200 rpm horizontal gas engine with high and low stage compressor cylinders 9" x 20" and 18" x 20" respectively. Price $3.750 f.o.b. present location 20 miles from Charleston, West Virginia. Address inquiry to Columbian Carbon Company, Box 873, Charleston, 23, West Virginia.

1 Oilwell Steam Pump, 16¼ x 7¾ x 20"
1 Gardner-Denver Steam Pump, 18 x 8 x 20".
Both pumps are in excellent condition, may be seen at Makin Drilling Company Yard, Hobbs, New Mexico. MAKIN DRILLING COMPANY, Box 1628. Hobbs, New Mexico.

EQUIPMENT FOR SALE

WELL drilling equipment, new or used Spudders, rotaries, core & shot hole drills tools, pipe, bits, blocks, pump jacks, valves Everything for well drilling and service Fishing tools rented. Pressey & Son, Pueblo Colo

DERRICK for sale. We have two guyed type derricks for lifting loads. Main derrick is 80 feet, swings 360 degrees on New Departure Thrust bearings. It also has 34 foot boom, longer boom can also be used. The derrick can also be used as a basket boom. Ideal for loading at a refinery. John A. Costelow Co., 125 Kansas Ave., Topeka, Kans.

I-90 H.P. 2 Cycle Superior direct connected compressor with high and low cylinders with intercooler ready to run. Box 546, Telephone 1060. Bartlesville, Okla.

FOR SALE: Wilson Super Drawworks, 3-speed chain transmission powered by two JL 1335 Buda Engines with V-belt compound, pump drive from rear. Drawworks and engines in excellent mechanical condition—recently overhauled. Maximum 4,000-foot drilling with 4½" drill pipe. For further information, contact Industrial Supply Company, Wichita Falls, Texas. Phone 2-3155 or LD 13.

FOR SALE: 1,700 ft., 7 in. l.w., 20 lb. casing. Tubing and rods. No. 1. 6,500 ft., 3½ in. seamless line pipe; 35 to 40 ft. random lengths. Clean, straight, ready to lay. 50 cents. M. J. Regan, Coffeyville, Kans.

EQUIPMENT FOR SALE

FOR SALE: One 36-L Bucyrus-Erie drilling machine, complete with tools. Also 1,943 ft., new 7 inch, 17 lb., H-40, range 2, seamless casing and 2,409 ft. of new 2⅜ inch, 4.60 lb., range 2, J-55, seamless regular tubing. Box E-812, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Seven used Jacobs Wind Electric Company gasoline engine driven cathodic generators in good condition with supply of spare parts. Also twelve Vickers oil pressure pumps Model V105AH, 5GPM, 1000 PSI with 3 H.P. explosion proof motors. Box G-140, The Oil and Gas Journal, Tulsa, Oklahoma.

ONE Emsco-500 equipped with 1-year old 250S Buda Diesel Engines, Lee C. Moore triple jackknife mast with substructure, Shaffer blowout preventer, steel mud tanks, Kelco power slips, 8,000 ft. 4½-in. drill pipe with Reed Shrink Grip tool joints. Rig is complete, in good condition, ready to run. Box G-125, The Oil and Gas Journal, Tulsa, Oklahoma.

Gaso Duplex 4½" x 6" Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units.

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 132—Rockdale, Texas
AT-3427—Houston, Texas

New Surplus Pressure Gauges Up To 50% Off!

MFR.	CAT. NO.	PRESSURE	DIAL SIZE	CASE	TUBE	CONN. SIZE "PIPE"
Ashcroft	1245	30"-0-1000#	8½"	Phenol	Steel	¼" back
Marsh	ICF	30"-0-800#	8½"	Phenol	Steel	¼" back
Marsh	Master Gauge	0-600#	8½"	Iron	Bronze	¼" bottom
Ashcroft	1279	0-500#	8½"	Phenol	Bronze	¼" back
Champion	.....	0-300#	8½"	Phenol	Bronze	¼" bottom
Ashcroft	1245	30"-0-200#	8½"	Phenol	Bronze	¼" back
Moore Prod.	.....	0-30#	8½"	Iron	Bronze	¼" bottom
Marsh	ICF	30"-0#	8½"	Phenol	Bronze	¼" back
Crosby	AA	0-400#	6"	Iron Case w/Brass Ring	Bronze	⅛" back
Crosby	AA	0-300#	6"	"	Bronze	⅛" back
Foxboro	Test Gauge	0-100#	6"	Iron	Bronze	¼" bottom
Crosby	AA	0-30#	6"	Iron Case w/Brass Ring	Bronze	⅛" back
Crosby	AA	0-24#	6"	"	Bronze	⅛" back
Crosby	AA	0-20#	6"	"	Bronze	⅛" back
Crosby	AA	0-10#	6"	"	Bronze	⅛" back
Crosby	AA	0-6#	6"	"	Bronze	⅛" back
Crosby	AA	0-5#	6"	"	Bronze	⅛" back
Marsh	ICF	0-1000#	4½"	Phenol	Bronze	¼" back
Marsh	ICF	0-800#	4½"	Phenol	Bronze	¼" back
Marsh	ICF (duplex)	0-800#	4½"	Phenol	Bronze	¼" back
Marsh	ICF	0-700#	4½"	Phenol	Bronze	¼" back
U.S. Gauge	509 S	0-160#	4½"	Iron	Bronze	¼" back
Marsh	ICF	30"-0-200#	4½"	Phenol	Bronze	¼" back
Marsh	ICF	0-100#	4½"	Phenol	Bronze	¼" back
U.S. Gauge	(duplex)	0-100#	4½"	Phenol	Bronze	¼" bottom
Ashcroft	1245 (duplex)	0-100#	4½"	Phenol	Bronze	¼" back
Marsh	ICF	30"-0-100#	4½"	Phenol	Bronze	¼" back
Ashcroft	1012	30"-0	4½"	Iron	Bronze	¼" bottom
Ashcroft	1010	0-15#	4½"	Iron	Bronze	¼" bottom
U.S. Gauge	Fig. 632 S w/Snubber	0-1000#	3½"	Iron	Steel	¼" bottom
U.S. Gauge	"	0-800#	3½"	Iron	Steel	¼" bottom
U.S. Gauge	"	0-600#	3½"	Iron	Steel	¼" bottom
Marsh	ICF	30"-0-160#	3½"	Iron	Bronze	¼" back

YOUR CHOICE ONLY $4.00 EA.

LARGE DIAL GAUGES

MFR.	CAT. NO.	PRESSURE	DIAL SIZE	CASE	TUBE	CONN. SIZE "PIPE"
Ashcroft	1079	0-1500#	12"	Iron	Steel	½" back
Crosby	AA	0-500#	12"	Iron	Steel	¼" back
Crosby	AA	0-300#	12"	Iron	Steel	¼" back
Crosby	AA	0-200#	12"	Iron	Steel	¼" back
Crosby	AA	0-160#	12"	Iron	Steel	¼" back
Marsh	Master Gauge	30"-0-15#	12"	Iron	Bronze	¼" bottom
A. H. Emery Co.	Test Gauge	0-25#	12"	Phenol	Bronze	¼" bottom

YOUR CHOICE ONLY $10.00 EA.

SMALL GAUGES

MFR.	CAT. NO.	PRESSURE	DIAL SIZE	CASE	TUBE	CONN. SIZE "PIPE"
Marshalltown	.....	0-30#	3" SQ.	Steel	Bronze	¼" bottom
U.S. Gauge	Fig. 509 S	30"-0-60#	2½"	Brass	Bronze	¼" bottom

ONLY $1.10 EA.

MISCELLANEOUS ITEMS

Pulsation Damper, ¼" ..... $2.00 Ea.
J. A. Campbell, Micro Beam Snubbers, ¼" ..... $5.00 Ea.

OVER 5,000 GAUGES IN STOCK. 5% DISCOUNT ON ORDERS OF $50.00 OR MORE ON ANY OF ABOVE ITEMS. 10% DISCOUNT ON ORDERS OF $100.00 OR MORE ON ANY OF ABOVE ITEMS. Prices F.O.B. Tulsa.

T & T TOOL 221 West Second Tulsa, Oklahoma

EQUIPMENT FOR SALE

4—125 hp. 300# WP Kewanee Oil Field Type Boilers. 1—85 hp. 125# WP Kewanee Oil Field Type Boiler. These boilers are in excellent condition. Woodford Supply Co., P.O. Box 84, Okla. City, Okla. Phone 3-1454.

1—G.M. QUAD Engine on skid connected to 20 groove sheave for Independent pump drive complete with 2500 gal. fuel tank—$9,500.00. Also have two (2) 10¾-6000# ORC Preventers, One (1) 10¾ 6000# DV Master Valve for sale or trade for 13⅜" similar equipment. T-W Drilling Co., 1407 National Bank of Commerce Bldg., New Orleans, La. CAnal-8220.

FOR SALE: Garnett, Kansas, One 50 hp. 13¼ x 16 Type C, Superior 2 cycle oil engine with plain bearings. Serial No. 20475. New 1937. $750. Joe A. Huitt, Deep Rock Oil Corporation, Tulsa.

OIL Field Casing. New 5½" and 7" German casing from Houston storage. Immediate delivery. P.O. Box 929, Houston, Texas.

5000' of 4½" API Full Hole Drill Pipe. 3,500' of 3½" Bottleneck Drill Pipe. 3,600' of 3½" Internal Flush External Upset Drill Pipe. All above pipe is Sonoscoped 70% #2 30% #3. Also 4600' 4" OD 14# R2 Sml. Drill Pipe w/5¼" OD Tool Joints. Milford Giffin, Tel. 477, Hoisington, Kansas.

CONVERTED MACK BUS—Interior beautifully finished in mahogany paneling, venetian blinds, all new tires, engine recently reconditioned. Ideal for Seismograph crew or similar operation. Price $3500. Sinclair Sales Co., Inc., 100 Milam Building, Houston 2, Texas.

SULLIVAN 210 cu. ft. per minute air compressor. Gasoline drive. Good Condition, Low Price. P. O. Box 2297 or Phone 4-7492, Tulsa, Okla.

FOR SALE: R. L. Cardwell with HXE Hercules Engine, 1st class condition, $6,500.00 Fred Cooper E 563 Winch Tractor, Single Drum mounted on six 75-inch Tires, 50 ft mast, fine condition service 5,500 feet of 2⅛ inch upset tubing. Box 1215, Tulsa. Phone 5-8850.

DIESEL ENGINES

1—McIntosh-Seymour Model 4-B-33, 400 HP @ 200 RPM, Ser. No. 1834

2—McIntosh-Seymour Model 4-B-34, 400 HP @ 200 RPM, Ser. No. 1915 and 1918

Engines will be in operation at Cromwell, Oklahoma, until Dec. 1, 1952, and available for removal shortly thereafter.

INTERSTATE OIL PIPE LINE COMPANY

P. O. Box 1349, Tulsa, Okla.

Attn: Mr. J. M. Bradley.
Phone 5-5581, Write or Wire

USED EQUIPMENT

1—Bethlehem Pumping Unit
35 HP—19000# Polish rod load
W/ ZC 503 F&M Gas Engine

2—Ideco Pumping Units
44 HP—19000# polish rod load
1—W/ 739 F&M Gas Engine
1—W/ 503 F&M Gas Engine

1—Tank Battery, 4—250 bbl. tanks
10'x20' Nt'l Treating System
2½'x10' Nat'l Separator

1—Tank Battery, 2—210 Bbl. tanks
2½'x10' Nat'l Separator

CASING—TUBING—LINE PIPE

BROWN PIPE AND MACHINERY COMPANY

1311 W. T. Waggoner Bldg.
Phone ED 9628, Ft. Worth, Texas

EQUIPMENT FOR SALE

FOR SALE: 1—60", 10 D section sheave with 4" bore. 1—12", 10 D section sheave with 4" bore. 1—B-J two stage centrifugal pump. C. N. Cannon, 801 Lexington Ave., Abilene, Texas.

FOR SALE: Failing "1500" Holemaster powered by Chrysler industrial power unit, mounted on 1942 GMC truck. Rig complete with mud pump, 1,000' of "N" rods, drill collar and core barrel, slips, elevators, subs, etc. Equipment showing very little use. 1—1942 GMC water truck, A-1 condition. For inventory contact P. O. Box 409, Del Rio, Texas.

FOR SALE: 7500' rotary rig w/ 7250'—4½" B.N. drill pipe, in good condition. Triple Lee C. Moore derrick & substructure. Rig is complete, & in good condition. Ready to drill. A real bargain. If interested write for inventory. P. O. Box 973, Duncan, Oklahoma.

FOR SALE: Regan Crown Blocks, Type EM, 5, 6 and 7 sheave 1¼" and 1½" groove, 300 and 500 ton capacity. 3—18 X 8 X 20 Gardner-Denver Mud Pumps. 5005 Holmes Road, Houston, Texas. Phone OL-2636.

FOR SALE

Good Used 48-L and 36-L Bucyrus-Erie Drill with or without Tools.

Beacon Supply Co.

Box 398, Pampa, Texas Phone 3377

FOR SALE

40,000' 10¾" used 32# line pipe

40,000' 10¾" used 28# line pipe

ROGERS AND WRIGHT COMPANY
710 Peoples Building
Charleston, West Virginia
(Phone 30171)

FOR SALE

5½" OD, 15½#, J-55, API, T&C, Range-2 300 tons per month January, February and March shipment.

BARON TUBE COMPANY

722 Oliver St., NW.
Atlanta, Georgia

FOR SALE

1—Elliott—Turbo Blower Sr. #643, Type O, 7950 C. F. M. Inlet Pressure 14.6 lb. per sq. in. ABS, Discharge Pressure 15.9 lbs. per sq. in. ABS, 3550 RPM, Sp-Gr. of Gas Air Bar. 29.8 in. H. G., Inlet Temp. 110° F. Coupled to a 75 HP, 220/440 Volt, 3600 RPM, 3 PH, 60 Cy. Elliott Motor—Drip Proof—Excellent Condition.

BRAZOS ENGINEERING CO.
224 Raines Street Houston, Texas
PHONE: FAirfax 8367

EQUIPMENT FOR SALE

FOR SALE: Walker-Neer 32-Special new in March 52, complete with all top-to-bottom tools, new lines and 1952 G.M.C. truck, W. H. Bass, phone 1376, Mt. Carmel, Illinois.

COMPLETE Cardwell rotary rig; 6 x 10 pump; 87' Lee C. Moore mast; 3,000' 4½" drill pipe. Price $30,000. Ready to drill. Box G-100, The Oil and Gas Journal, Tulsa, Oklahoma.

LARGE National Pumping Unit TH 601 H-40 complete with Cooper Bessemer 40 H.P. Vertical Gas engine, cooler, starter, engine house. Ready to go. Also back crank with extra Jack if desired. Excellent condition. Must be moved now from abandoned wells. Write or phone 6-4847, S. M. Goldschmidt, Box 1092, Wichita 1, Kansas.

FOR SALE: One 66 Wichita Spudder, 180 H. P. Leroi, Roller Bearing Shear Poles, K-B International Truck & Trailer, with or without tools, 15" to 5⅞". E. N. Brock, Box 125, Phone 423, Artesia, N. Mexico.

WANT EQUIPMENT: Did you find the equipment you wish to purchase in this column? If not, use an "Equipment Wanted" classified advertisement to find it. It is available somewhere and Journal classified advertisements will find it. See box heading for classified rates, or write The Oil and Gas Journal.

EQUIPMENT WANTED

WANTED: Three engine compound for Wilson Titan drawworks. Makin Drilling Company, Box 1628, Phone 3-3141, Hobbs, New Mexico.

WILL PAY highest prices for used casing, used line pipe, abandoned leases, or other surplus lease equipment. Your idle producing equipment is worth dollars. Green Pipe & Supply Co., Box 1363, Tulsa, Oklahoma.

WANT 7⅞ x 12 used Emsco, Gardner-Denver, Oil Well or Lucy mud pump—late models only that are in good shape. R. F. Hare, 2018 W. T. Waggoner Bldg., Ft. Worth, Texas.

WILL BUY, Used, Late model Bucyrus 22-W (with 40' mast). R. F. Hare, 2018 W. T. Waggoner Bldg., Ft. Worth, Texas.

EQUIPMENT NOT IN USE: Did you find a buyer in this column for the equipment you have for sale? Someone wants it and an "Equipment For Sale" classified advertisement in the Journal will find a buyer. See box heading for classified rates or write The Oil and Gas Journal.

HELP WANTED

WANTED: SEISMIC SUPERVISOR. Must have Party Chief experience, age 30 to 38, degree Geology or Geophysics. Replies will be kept strictly confidential. Call or write giving complete experience. A. E. "Sandy" McKay, Continental Geophysical Co., 602 Continental Life Building, office phone Fannin 9231, Residence phone Sunset 6053, Fort Worth, Texas.

MANUFACTURERS representative for established line of oil field specialties in North Texas, Panhandle and West Texas-New Mexico area. Advise experience, lines now being handled and territory covered. Box 2632, Tulsa, Oklahoma.

MECHANICAL ENGINEER for design and/or field installation of gas process equip. At least 2 years exp. in plant process or construction. Leading S. W. Manufacturer. Box E-993, The Oil and Gas Journal, Tulsa, Oklahoma.

WELL integrated oil company, operating in the Mid-Continent and Rocky Mountain areas, is interested in a capable and experienced geologist with sufficient geologic background and experience in exploration to assume the position of Manager of Exploration and Geological Departments. Salary open. All replies will be held in strict confidence. Box G-146, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Experienced contact man to represent well established oil field service company in West Texas. Prefer background of petroleum engineering or geology. Excellent opportunity. Please write brief letter giving qualifications. (Our employees know of this ad). Box G-141, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

WANTED: Chief Engineer for independent MidContinent refinery to take charge of the Maintenance and Inspection Department. Applicant should have experience in inspection work, choice of materials, and refinery maintenance. Box G-131, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men. Salaried positions—$3600 to $30,000. This confidential service for outstanding men who desire a change of connection. Will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 434 Frick Bldg., Pittsburgh 19, Pa.

SEISMIC PERSONNEL needed for United States and Canada by well known and expanding contract geophysical company. Address Box E-863, The Oil and Gas Journal Tulsa, Oklahoma.

SUBSURFACE Engineer: Medium sized, rapidly expanding production company with headquarters in Houston and production in East, South and West Texas, needs competent petroleum engineer with considerable geological experience to head up subsurface end of engineering department. Should have minimum two years field engineering experience in production, drilling, completions, workovers, and well geology, and in addition, have two to three years specialized training and experience in geological engineering with some degree of responsibility in directing development programs. State complete details of education, experience, and salary range which would be acceptable. Will consider applications from geologists who feel qualified. All applications will be treated as confidential and will be given immediate consideration. Box G-138, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY EXECUTIVE

Chemical Engineer, age 32-45, with direct experience as Superintendent, Assistant Superintendent or equivalent in sizable refinery wanted for top executive position. Experience in processing sour crudes desirable. Position will require not only review and supervision of operation within refinery but also contacts with other members of the industry and participation in negotiation of Purchase and Sales Contracts. Salary open. All replies will be kept in the strictest confidence. Box G-142, The Oil and Gas Journal, Tulsa, Oklahoma.

. . CHEMICAL . . ENGINEER or CHEMIST

Major Company has opening in Venezuela for Chemical Engineer or Chemist with experience in operation of Podbielniak Column.

Prefer also experience in operation P.V.T. equipment but not essential requirement. $7188 annual earnings plus maintenance.

P. O. BOX 35
Bowling Green Station
New York 4, New York

. . RESERVOIR ENGINEER . .

Major Oil Company in Venezuela has opening for Graduate Petroleum Engineer or Geologist for work in Production Laboratory. One year's experience with PVT equipment desirable.

WRITE GIVING FULL DETAILS TO: P. O. BOX NO. 35
Bowling Green Station, New York 4, New York

HELP WANTED

OIL Industry Employment Service, 405 Tuloma Bldg., Tulsa, Okla. 4-5974. Tom Robinson, owner. For Technical and Trained Personnel, including LPG.

ASSISTANT Controller — Integrated oil Company in Mid-Continent area is seeking an experienced Assistant Controller. Position requires top-level man with experience in oil, systems and costs. Please submit resume which must give complete data on experience, salary requirements, and personal history, including education, background and associations. Box E-965, The Oil and Gas Journal, Tulsa, Oklahoma.

WELL integrated oil company, operating for the most part in the Mid-Continent and Rocky Mountain areas, is interested in man with executive background and ability to assume position of Vice President in charge of Exploration, Production, and Land Departments. Position open due to retirement of present head involving reorganization. Marvelous opportunity for right man with sufficient qualifications. No other need apply. Salary no object. Box G-147, The Oil and Gas Journal, Tulsa, Oklahoma.

THE POSITION YOU WANT: Oil industry companies are looking for men to fill every conceivable kind of position. If you didn't find the position in this column that you are looking for, use a "Situation Wanted" classified advertisement to state your qualifications. Some company is probably looking for your ability. See box heading for classified rates or write The Oil and Gas Journal

SITUATIONS WANTED

REFINERY Superintendent, Age 43, with 22 years experience in operations and construction, three years foreign service, desires new connection with opportunity. Box G-139, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY Executive. 18 years experience Process Engineering, Refinery Operation, Producing, Pipelines, and Administration with Major Oil Company in Domestic and Foreign Service. M.S. degree in Engineering. Desire position with Oil Company in California. Age 41. Family. Box G-143, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer, registered, 32, Texas A&M. Two years drilling and production; 4 years tubular goods and pressure vessel sales. Would like to represent independent or contractor as contact man. Will consider higher level sales work, sales engineering, or manufacturer's representative. Extensive contacts in Gulf Coast Located Houston. Box G-151, The Oil and Gas Journal, Tulsa, Oklahoma.

PIPELINE SUPERINTENDENT: M.E. Degree. Age 34, married. Experience: two years general and 5½ years pipeline, crude and products. Economics, evaluation, design, construction and operation. Presently employed Pipeline Superintendent major Oil Company. Eastern U. S. Desire relocation Southwest or West Coast. Box G-145, The Oil and Gas Journal, Tulsa, Oklahoma.

CONSULTING ENGINEER. Available for fee or retainer representation in Rocky Mountains, Permian Basin, and Kansas. Evaluations and Supervision of Royalty or Operating Interests. Geological Reports and Deal Negotiations. References. Box E-968, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION WANTED

"IS THIS THE TIME TO SELL YOUR PRODUCTION?"

Payment of capital gains tax today, nets you an amount almost comparable to your ultimate net realization (after taxes and depletion).

If you should consider selling—**WE WANT TO BUY,** as cost depletion will give us an entirely different tax basis. We are reliable and financially responsible producers. Bank references will be readily furnished. **We are not brokers.**

Also interested in drilling proposals with geological merit. We are not interested in Conversation, we want to buy or drill. Please submit your proposals and they will be given courteous, prompt and business-like attention. All inquiries will be held in strictest confidence.

BOX G-109, THE OIL AND GAS JOURNAL, TULSA, OKLAHOMA

SITUATIONS WANTED

CHEMICAL Engineer, married, age 41, with heavy experience in project engineering and operation desires position of major responsibility. Box G-153, The Oil and Gas Journal, Tulsa, Oklahoma.

COMPANY PILOT or sales representative. Airline & sales background. All ratings including A&E, Amphibian exper. College grad, family man. Domestic or foreign. Box G-149, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEER: 10 years' experience in drilling and production, excellent references. Box G-111, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION SUPERINTENDENT - PETROLEUM ENGINEER. Oklahoma University. 11 years responsible operational and administrative experience. 5 years sales and management technical services and tools, 4 years assistant general superintendent drilling and producing, 2 years general production manager Kansas and Rocky Mountains. Experienced leases, deal negotiations, geological and engineering evaluations, drilling and producing operations, sales and management. Will carry load and earn way with established, active organization operating Mid-Continent or Rocky Mountains. Age 38. Details without obligation. Box G-115, The Oil and Gas Journal, Tulsa, Oklahoma.

SPECIALTY Representative—16 years Gulf Coast experience selling oil field specialties and supplies. LLD and BA degrees. Age 46. Desire specialty connection, not supply. Available immediately. Box G-150, The Oil and Gas Journal, Tulsa, Oklahoma.

CORROSION Engineer desires to relocate in Southwest. Six years experience in Cathodic protection of bare and coated pipelines and pipeline construction. Box G-144, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION Engineer desires responsible position with progressive oil operator. Five years experience in developing, producing, and evaluating oil properties for both major and independent producers. Box G-152, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer, Production Superintendent. 6 years experience Gulf Coast area, drilling and production. Desires position with active organization. Box G-148, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 1628. Ph. No. 3-3141, Hobbs, New Mexico.

PRODUCTION WANTED

OIL PRODUCTION
WANTED—ANY AMOUNT—ANY AREA

Full details required. Must stand Engineering investigation. CONFIDENTIAL.

TAXMAN OIL COMPANY
414 Finance Bldg. Kansas City 6, Mo.

ROYALTIES

WILLISTON BASIN ROYALTIES
Dealers in Montana royalties since 1921. We now specialize in royalties under major company leases in the Montana portion of the Williston Basin. For information on our method of operation, write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

JACK EAGLE—Pay you immediately for your producing royalties and Overrides, absolutely no delay, send complete details. 708 City Nat'l Bldg., Okla. City, Okla. REgent 6-7027.

GET TOGETHER: Both Capital and Royalties are available. If the investment proposition you want isn't listed in this column use a Journal classified advertisement to find it. See box heading for classified rates or write The Oil and Gas Journal.

PRODUCTION
We Will Buy
PRODUCING landowners royalty and producing leases. Any amount, any area. Confidential information required and furnished. A 1 Bank Reference.

COMBEST ROYALTY COMPANY
825-826 Amarillo Bldg.
Amarillo, Texas

LEASE AND DRILLING BLOCKS

WANTED: Producing oil, gas properties, anywhere, $250,000 to $5,000,000. Confidential. American Oil Company, Box 38, Houston, Texas.

FOR SALE: Producing Oil Lease. Almost 700 acres Eastern Kansas. Oil 32 gravity. Suitable for water flood. Have core analysis. W. R. Jenner, 501 South Topeka, Wichita 2, Kansas.

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STOLEN!!! New christmas tree valve from Central Pennsylvania. 10,000# test. Serial No. 51-52-10-1044. Manufactured by Oil Center Tool Company. $500.00 reward information. Box G-124, The Oil and Gas Journal, Tulsa, Oklahoma.

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OFFICES for rent to responsible company operating in Denver-Julesburg Basin. Excellent location. William B. Paynter, Brush, Colorado.

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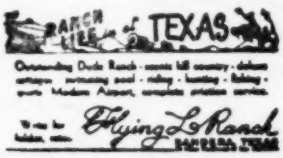

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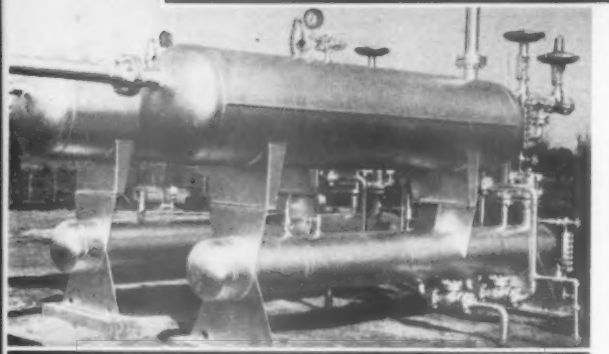
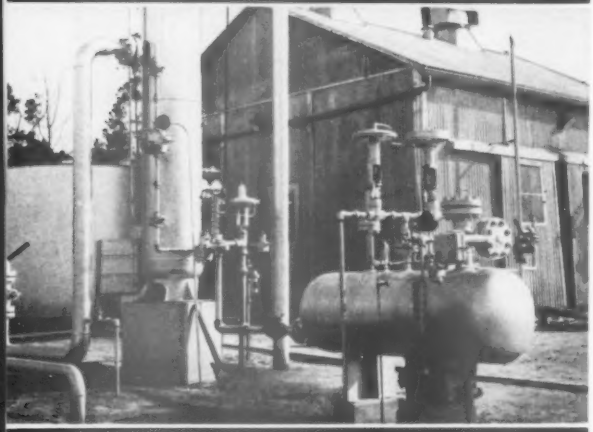
National

COMBINATION SEPARATOR & FLUID BOOSTER



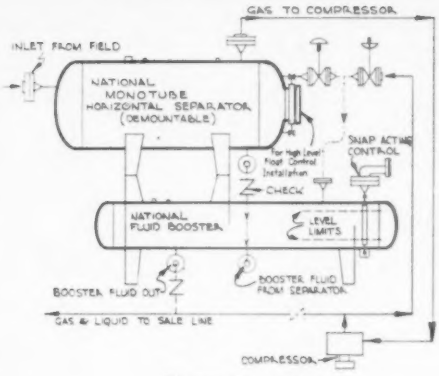
2—30" 500 PSI Oil and Gas Separators with 16" 1200 PSI BOOSTERS. Compressing gas at this site from 350 PSI to 1100 PSI.



24" 1500 PSI Fluid Booster operating in conjunction with a vertical Oil and Gas Separator and Gas Compressor.

30" 1000 PSI Oil and Gas Separator with 10" Water Leg and 24" 1500 PSI BOOSTER. Fluid is boosted from 800 PSI line into 1350 PSI line.

(Patented and Patents Pending)



FLOW DIAGRAM

APPLICATION

Usual application is in producing areas where well head pressures have fallen to a less pressure than the existing gas sale line pressure. Here the unit is used in conjunction with a gas compressor.

Typical of this situation is the Carthage Field in East Texas which is supplying gas to a 1050 PSI transmission and gathering line whereas the field producing pressures have fallen to 400-600 PSI.

OPERATION

The fully automatic unit operates as follows: The well product enters the separator where gas is separated and scrubbed of any entrained liquid. The liquid flows to the booster and gas flows to a compressor. When fluid level builds up in the booster to a prescribed level, a snap acting control opens and closes simultaneously the two valves in the line from the discharge side of the compressor. No gas is vented when double valving is used. Pressure equalizes on the booster with that of the compressor outlet. The liquid then flows from the booster and is comingled with the gas downstream of the compressor and flows then into the sale line.

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Why Burn Down Your House for Roast Pig?

IN ancient China, men ate meat raw. But one day, while Ho-ti the swineherd gathered mast for his hogs, his stupid son Bo-bo, playing with fire, burned down their straw hut. Bo-bo sniffed the odor of burnt pig. He touched one to see if it was still alive, scorched his fingers, put them in his mouth and was amazed at the delicious taste. Father came home and caught his son devouring a pig. Ho-ti tried one, too, found it intoxicatingly sweet and satisfying.

Thereafter, neighbors observed feverish building of new straw huts at Ho-ti's, followed always by conflagrations. The secret leaked and fires became widespread. In a few weeks even his Lordship's town house was on fire. Finally, straw for hut building disappeared from the market and young pigs could not be had for love or money. At last, after many generations, a wise man arose who said that a pig could be roasted without burning down an entire house.

Thousands of years later, we Americans feast deliriously on "roast pig." Accompanying our delights are fires of inflation, which can destroy our values just as certainly as the roasting of Ho-ti's pigs consumed his earthly possessions. But surely we need not await the coming of a sage to tell us not to burn down our houses to enjoy the delights of roast pig!

Let us unite to stop the ruinous flames of inflation. Curb wasteful and unnecessary government spending. Balance our Federal budget. Control our national debt and reduce taxes. Only in this sane way can we produce more straw and enjoy our houses, raise more pigs and eat them, too.

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